

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

[PRICE 6D.

[illegible]

LAW INTELLIGENCE.

INFRINGEMENT OF PATENT—ANDREW SMITH'S WIRE ROPE.

THE QUEEN v. NEWELL.—This was an application made by the defendant to strike out several of the pleas in the plaintiff's declaration, which were declared to be immaterial repetitions, and not at all connected with the case. It was argued, on the part of the plaintiff, that the Master of the Rolls had no power to strike out pleas, there being no precedent; and further that the plea in defence to the writ was not immaterial, but of the most vital importance to the case. The MASTER of the ROLLS stated that he would consult the common law judges upon the point raised, and make known his determination to the parties. [We are enabled to state, on authority, that the Master of the Rolls has, since the hearing, declared that the pleas, as put in by the plaintiff, must stand, and that the application made has been refused. Mr. Hindmarsh appeared on behalf of the Crown.]

RESPONSIBILITY OF CLERGYMEN IN CONNECTION WITH JOINT-STOCK COMPANIES.

EX PARTE SALKELD, CLERK, RE O'NEIL AND OTHERS.—Mr. SWANSTON (with whom was Mr. HARRIS) appeared in support of this petition, which requested the validity of the fiat. There were three persons, of whom the petitioner was one, who were engaged in certain mining transactions in Glamorganshire, but not constituting a trading company, the fiat having issued long before the last Act of Parliament, which has much extended the law on that point. In 1839 the parties in question became lessees of iron, stone, and coal mines; but by the terms of their lease restrained from creating particular offensive works, in consequence of the proximity of a mansion-house. The works in the colliery and iron mine occasioned a demand for the use of implements of cast iron, for the purpose of carrying on the operation of smelting in an adjacent parish. In order to supply these articles a foundry was erected, and the proprietors, being unable to smelt their own ore, were obliged to buy pig-iron to be converted into articles of use. Several neighbours happened at the time to want some cast iron, and some was sold to them, not from ore raised by the firm, but from what they had themselves purchased for manufacture. This, it was apprehended, could not be held to constitute a trading, as the acts done were not with a view to obtain a livelihood thereby, but merely incidental to arrangements for procuring their own produce and making the same disposable. The petitioner, who had no unfavourable interest in these unfavourable speculations, was a benefited clergyman, and, under Lord Stowell's Act, his trading was illegal, and the contracts not binding. It was held on well-known cases relating to joint-stock banks that contracts were vitiated in similar circumstances, and the law was altered subsequently so far as related to the liabilities of joint-stock banks; but it would be for the other side to show that the exceptions then introduced could enter the case of a private trading partnership. The CHIEF JUSTICE observed, the Act intended to do not appear to limit its operation to joint-stock companies, whether banks or otherwise, and added, that if it had done so he should have felt some difficulty in defining what did or did not constitute a joint-stock company. The violation of contracts by the reason alleged was not apparent, as the statute known as Lord Stowell's Act appeared to be repealed. Mr. SWANSTON proceeded to contend that whatever had been done which bore any appearance of trading had been merely incidental to the working of the mines and manufacture of pig-iron, and not constituting a trade, as defined by Lord Lyndhurst in "Re parte Burgess," and by the Court of Queen's Bench in "Hind v. Rogers." The only question was as to the onus of the proof at the time, relative to which it was to be borne in mind that until January, 1841, the parties were unable to smelt their own ore, and that subsequently to that date it was admitted no purchases were made. Another point raised had no better foundation, as it appeared the parties had contracted for the supply of a certain quantity of coal, and had purchased a portion from others in consequence of their being unable themselves to raise the given quantity within the specified time. The debt due to the banking firm who had sold out the flat was not complete until April, 1841, and the trading, if indeed any had ever been carried on, ceased in the January previous, when the smelting commenced.

Mr. Russell and Mr. Anderson, in support of the fiat, were not heard.

The CHIEF JUSTICE said it was not a sufficiently clear case to call for a writ. There had been purchases of large quantities of pig-iron, the manufacture of the same, and sale of considerable portions. The question certainly turned on the nature of the parties; and it was not sufficiently clear that the acts in question ought not to be held to constitute a trading. He was unable, in such a state of circumstances, to supersede, but was willing to give any facilities for the trial of an action thereon. He would therefore ask the counsel for the petitioner if they were prepared to adopt that course. Mr. SWANSTON said his client was, he believed, unfortunately not in a condition to take advantage of the course offered. The CHIEF JUSTICE: The case is not one on which it would be proper to supersede a fiat; nor is it such a case as ought at present to be dismissed. Take a week to consider the point; and if the alternative is not accepted, and terms proposed for arranging and trying the action at law, let the petition be dismissed.

HASTINGS AND RYE BRANCH OF THE SOUTH-EASTERN RAILWAY.

This projected line, which is intended to join the South Eastern at Staplehurst, and to pass over it near the same place, to unite with the proposed Maidstone and Gravesend Railway, at Maidstone—on the importance of which, in conjunction with the French line, we offered some remarks in an article, headed "Direct Communication between London and Paris by railway," in our Journal of the 24th ult.—now bids fair to be very soon in course of formation. A provisional committee of eleven directors is formed (all gentlemen of the counties of Kent and Sussex), and an honorary secretary appointed. The prospectus just issued states that the works will be completed at a much less cost per mile than any other line in the Kingdom, and it is confidently calculated that the maintenance of way will not exceed 30s. or 40s. per mile per annum. The management being in the hands of directors connected with the immediate locality, it is reasonably anticipated that the landholders, confiding in them, will naturally render all the assistance in their power, and this in itself is sufficient guarantee that it will be so constructed as to secure at low charges the traffic of passengers and the transmission of goods, cattle, hops, &c., &c., and by this circumstance they are in a great measure protected from imposition and extravagant demands in the purchase of the land through which the line will pass. Under these favourable circumstances the directors securely calculate a return of from ten to fifteen per cent. on the capital invested, quite exclusive of a large portion of continental traffic, which must pass over it, as the readiest communication with this country from Paris, through Boulogne, Montreuil, St. Valery, and Dieppe. To enter at full into all the advantages which this line will offer to the travelling public is more than our space at present will allow; but we will mention one or two of the most important. The saving of expense to a steam-vehicle making two trips per week from Rye to the opposite part, as compared to Dover, will be 20s. per annum; a much greater difference between Rye and Dieppe, as compared with Shoreham and Brighton, and a consequent saving of time and expense. The harbour of Rye can, at a very trifling cost, be made of the greatest capacity, and far superior to Dover; this has long been known to engineers and naval men, and has occasioned much astonishment that a harbour with such an immense securing power should have been so long neglected, where, by the expenditure of a small amount, in comparison with the important advantages certain to be obtained, steam-vessels might enter at all times of tide. Indeed, this, in connection with the present projected railways in France, is of such vast importance, that reference to a map will at once remove all doubt, and prove that this (forming as it will a portion of the trunk line to the Continent) will be the most profitable in England in proportion to the capital employed. Arrangements are made that communication to the directors will depend on the execution of the works within the estimates. Interest will be paid on instalments from the date of payment of first call, and a deposit of ten shillings per share will be ample for preliminary proceedings to obtain the Act of Parliament; but no payments are to be received before the proper plans, estimates, &c., are prepared and laid before the public, as the cost of survey and estimates will be advanced by the directors. We understand that most of them are experienced trustees of turnpike-roads, and, consequently, there will be no ordinary embarrassments nor excess of estimates. The journey from London to Hastings, by this line, can be performed in six hours, at a charge of 12s., being 1s. for the railway fare from London to Rye, and 11s. by steam-vehicle. From Rye to Hastings, this will enable passengers to avoid a night passage by steam-vehicle from London, and many other expenses incurred for entertainment on a journey of twelve or fourteen hours.

WEST LONDON RAILWAY.—With much pleasure we learn that the whole of the new shares of the West London Railway Company have been subscribed for, and that operations for completing the works are to be resumed without delay. A notice of "call" on the new shares appears in our advertising columns. The infusion of new blood into the management has not been without good effect.—*Railway Times.*

NEW GLASS.—The immense conservatory at Chisworth is being glazed with a new description of glass, called "patent diamond crown glass," by means of which, in the ridge and groove mode of roofing, invented by Mr. Potts, a great improvement may be made in the construction of various descriptions of buildings. This glass is much thicker than common crown glass, and the pane may be made fifty inches long, at the same cost per foot as ordinary glass panes.

ON THE USE OF MINERAL WATERS.—The beneficial medicinal effects produced by the use of the water of mineral wells is attributed to the presence of Bromine, which is found in very minute quantities in all those wells that are of all nations.

PROCEEDINGS OF SCIENTIFIC BODIES.

GEOLOGICAL SOCIETY OF LONDON.

Nov. 20.—Mr. Murchison, President, in the chair. Three papers were read.—1. "On the Bala Limestone," by Mr. Daniel Sharpe, F.G.S.—Notwithstanding the agreement of several of our best geologists, who had published their opinions on the age of the Bala limestone, and had placed it in the upper Cambrian system, Mr. Sharpe was induced to doubt the accuracy of this classification, by observing that every one admitted that the Bala fossils agreed, as far as they had been examined, with those of the lower Silurian beds, and that the attempts to draw a clear line of separation between the lower Silurian and upper Cambrian had failed; but his attention was particularly drawn to the district by Mr. Bowman's observations on Drabighshire, laid before the British Association in 1840 and 1841, and since published in the 1st volume of the *Transactions of the Geological Society of Manchester*, which Mr. Sharpe regards as the first indication of the true structure of this part of North Wales. Mr. Bowman classes as upper and lower Silurian many beds before mapped as upper Cambrian, showing that the previous classification of the rocks of North Wales could not be relied upon. He points out, that up to the moment of his taking up the subject, none of the writers upon it had expressed a doubt of the existence of a great thickness of fossiliferous beds below the Corand sandstone and Llandovery flags, although it had at last been admitted that these supposed beds could not be distinguished by their fossils from the lower Silurian; and he states that the object of his communication is to show the error of this view as relates to the Bala rocks, which he proposes to prove to be equivalents of the lower Silurian beds, described by Mr. Murchison, and not part of an older series; and he infers, from analogy, that the same will be found the case in other parts of North Wales which he has not visited, where he conjectures that all the rocks containing shells of lower Silurian species will also prove equivalents of the lower Silurian beds of Siluria. Instead of continuing the Silurian system downwards, through a vast thickness of slate rocks, Mr. Sharpe proposes to strike out one of its original members, regarding the *Corand sandstone and Llandovery flag* as the same formation, which has received different names according to its mineral character; he observes, in confirmation of this view, that both formations are never found equally developed in the same district, and that the fossils found throughout are too nearly the same to warrant the separation of the lower beds under a separate name. Still Mr. Sharpe believes that there are in Wales, as in Westmoreland and Cumberland, vast accumulations of slaty rocks below the Silurian system, in which no fossils have been found, and which must retain the name of Cambrian rocks. Mr. Sharpe did not map the district in detail, but he traced two sections, to show the position of the Bala beds with regard to the Berwyns, as he considered the question to turn upon the accuracy or error of the statement of Mr. Murchison—"that the Bala limestone dips under the chief mass of the Berwyns." The first section begins westward, at the igneous chain of Arenig Mawr, crosses the town of Bala, and ends eastward, at the Calletter, where a dark slate (the upper bed of the Bala series) abuts unconformably against the clay-slate of Moel-Haleg, which is referred to the Cambrian system. This section places the Bala beds in a detached trough, and shows that they do not dip under the Berwyns; but their succession is not well shown, owing to the disturbed state of the surface. The other section is in two parts, from the head of the lake of Bala up the Twrch to Bwlch y Groes and across the Dyff by Dinas Mwydy and Mallowd; on the west it begins at the northern prolongation of the igneous chain of Arenig Mawr, and continues eastward, through a conformable succession of beds up to the upper Silurian; each section shows the whole of the Bala series—the upper bed of blue slate, which on the Calletter rests unconformably against the Cambrian clay-slate, being the same which is overlaid conformably beyond Mallowd by an upper Silurian series of soft blue, or liver-coloured, shales, alternating with hard grey grits, without cleavage or fossils, dipping E.S.E.—which Mr. Sharpe identifies with the No. 2 of Mr. Bowman's lower division of the upper Silurian, the probable equivalents of the Wenlock shale. Mr. Sharpe then describes the Bala series of rocks, beginning with the uppermost beds—1. Dark blue slate; worked at Craig Calletter, for good roofing-slate and flags. The lower beds pass into a soft argillaceous slate of no value. The whole is not less than 300 or 400 feet in thickness. 2. Upper Bala limestone; a dark blue bed, 10 feet thick, accompanied by calcareous slate and soft brown shale, with many fossils. 3. Rotten argillaceous schist, and indurated shale; 400 feet thick, with few fossils. 4. Bala limestone, like No. 2; 30 or 40 feet thick, with calcareous shales and grits, full of organic remains. 5. Grey slaty grits, with a bed 30 or 40 feet thick of impure grey limestone, containing trilobites and other fossils in the lower part; the whole exceeding 500 feet in thickness. 6. Rotten grey clay-slate; supposed to be 500 feet thick. 7. Dark blue slate of poor quality; the lowest bed of the series.—As the Bala beds are quite unconformable with the Cambrian rocks of the Berwyns, and are only overlaid by upper Silurian deposits, as most of their organic remains are known lower Silurian species, and as the total thickness of the whole series is about the same as has been assigned by Mr. Murchison to the lower Silurian, Mr. Sharpe concludes that they are the exact equivalents of the lower Silurian formation, and do not carry the series down below the beds described by Mr. Murchison. Mr. Sharpe considers it as easy to prove their identity with the *Corand sandstone* as with the *Llandovery flag*, and again endeavours to show that they must be regarded as the same formation under different names. This classification replaces the dark blue limestones of Bala and Coniston on the same parallel range which they were separated when Professor Sedgwick adopted Mr. Marshall's views of the Silurian age of the Coniston limestone, but left the Bala limestone in its erroneous position, as part of the upper Cambrian. The igneous rocks of Arenig and Aran Mowddwy are described by Mr. Sharpe as varying compounds of felspar and quartz, and he maintains that this must have been upheaved after the epoch of the Lower Ludlow shale.

3. "Notice of the Discovery of the Remains of Insects in the Lias of Gloucestershire," with some Remarks on the Lower Members of this Formation." By the Rev. P. B. Brodie, F.G.S.—The lower beds of the lias in which these organic remains occur, are extensively developed in the neighbourhood of Gloucester and Cheltenham, and occupy the greater part of the vale. In the upper part of the lower beds one example only occurred of a fossil insect, being the elytron of a coleopterous insect of the family *Curculionidae*, apparently a species of *Acoryphus*, of Escholtz. With this exception, the numerous fossil insects obtained by Mr. Brodie, were found in the bottom part of the lower beds near the base of the lias, which are seen at several points in the neighbourhood of Gloucester. At Waindole Cliff, in a grey and blue limestone, termed by Mr. Brodie lias limestone, 20 ft. 2 in. above the bone bed, and 6 ft. 2 in. above a hard yellow limestone, containing shells like *Cyclas*, plants and cypris are found, cypris belonging to several genera of *Colopoda*, a few wings, not unlike the genus *Tipula*, and a number of insects, apparently of the great tribe, associated with shells of the genera *Ostris*, *Unio*, and *Modiola*. To the south-west of Combe-hill, the same limestone contains similar remains in greater abundance, among which are some beetles in a tolerable state of preservation, and in one the eyes are distinctly visible. A few imperfect but large wings of dragon flies also occur. With these are numerous small plants, some resembling mosses, but very different from those in the yellow cypris limestone, a few seed vessels and leaves of ferns, claws of crabs, and remains of crustaceans, resembling the genus *Cypris*, from the *Solenastrea* slate. Near Gloucester, and in the cliff at Westbury, the same limestone and insects are found. If the cypris found in these beds be of freshwater origin, it forms a new and highly interesting feature in the history of this deposit. At any rate, the occurrence of the remains of such delicate creatures as insects, many of which are in a beautiful state of preservation, and could not, therefore, have been long subject to the action of the waves, or have been carried far out into the water, gives a greater probability to the supposition that this part of the lias may have been formed in an estuary which received the streams of some neighbouring land, perhaps numerous scattered islands, and which brought down the remains of insects, cypris, and plants above referred to. The shells usually found in the lias limestone are *Modiola* and *Ostris*, both of which frequently exhibit *valvulae*, and are capable of living in brackish water as well as in the open sea. Mr. Brodie has discovered the wing of an insect in the upper lias at Dumbleton, near Tewkesbury, proving the existence of insects during the deposition of the upper portion of this formation, and Mr. Strickland has found elytra and wings in the lower division at Evesham, twenty miles from Waindole.

3. "On Certain Impressions on the Surface of the Lias Bone Bed in Gloucestershire." By Mr. H. E. Strickland, F.G.S.—These impressions have been noticed at only one locality, Waindole Cliff on the Severn, where they occur in the uppermost surface of the band of micaceous sandstone, there representing the "bone bed." The deposit appears to have consisted of a fine-grained muddy sand, capable of receiving the most minute impressions, whilst the pure black clay which forms the superincumbent stratum, has preserved the ancient surface in the most unaltered condition. The markings are of five kinds—1. Lengthened and nearly straight, grooves about one-tenth of an inch in width, and several inches long, very shallow, and with a rounded bottom, apparently caused by some object striking the surface of the sand with considerable impetus. They may have been caused by fish swimming with velocity in a straight direction, and occasionally breaking the bottom with the under part of their bodies. 2. Small irregular pits averaging one-quarter of an inch wide, and one-eighth of an inch deep, possibly caused by sand-boring fishes probing and turning up the surface in quest of food. 3. Narrow deep grooves about one-twelfth of an inch in width, the sides forming an angle at the bottom, irregularly curved, and making abrupt turns, possibly caused by the movements of an amphipodous mollusc, the *Paludina*? 4. A tortuous track, consisting of a slightly rounded ridge about one-tenth of an inch wide, with a fine linear groove on each side, in all probability caused by the crawling of some of the smaller annelids. A comparison of the above tracks, with those made by living crustaceans, and molluscs of the genus *Limulus*, afforded only negative evidence. They were accompanied by impressions of a fossil body.

INSTITUTION OF CIVIL ENGINEERS.

JAN. 10.—The first meeting of the season was commenced by a discussion upon a paper by Mr. R. Davison, describing the sinking of the deep well at Messrs. Truman and Co.'s brewery. In the opinion of some of the members, the difficulties which had occurred in the sinking of the cast-iron cylinders arose from the attempts to force down too great a length at a time; it was usually found that lengths of more than thirty feet each, were liable to be impeded by the lateral pressure of the surrounding earth. The pumping also of the water, from the well, whereby a large quantity of sand had been raised, had caused the cavity to take place behind the cylinders, and the face of the sinking of the well; it was found essential during the progress of a well through sandy stratum, to preserve such a depth of water in it, as should, by its pressure, keep back the sand; for if the equilibrium was for a moment destroyed, the sand ran in, and filled up the bottom, leaving a cavity behind the cylinders, and, in some cases, this had endangered the surrounding building, by causing the earth to give way for some distance round the well. It is more advantageous to carry the cylinders down to the chalk, and to excavate a full-sized well in that stratum, where side drifts may be cut, so as to gain a copious supply of water, and secure, at the same time, a reservoir in the chalk; as was done by Mr. Drithwaite, at Messrs. Reid and Co.'s well in Ligonier-street brewery. The author explained, that in order to guard against destroying the equilibrium between the water and sand, he had given instructions that the water should not be drawn below a certain point in the well; unfortunately this had not been attended to, and the influx of sand had ensued. The action and use of the "miser," or "auger," for excavating the earth in well sinking, without pumping, was fully described, and a complete account of the well now sinking at the Royal Mint was promised to the institution by Mr. Clark, of Tottenham, who has executed so many of these works. It appeared that this useful instrument was first introduced by the late Mr. Vallamy, of Pall Mall, in sinking some deep wells, which were intrusted to his direction.

A paper was read on "The Co-efficient of Labouring Force in Overshot Water-Wheels," by Mr. R. Mallet. The communication was so voluminous, and so interspersed with mathematical formulae, that it was necessarily read in abstract. It gave a brief historical account of the theory of water-wheels according to the experiments of Borda and Smeaton. The opinions of the latter engineer as to the relative proportion of the diameter of the wheel to the height of the fall—it quoted Dr. Robinson's doubts whether any advantage was gained by the large diameter of the wheel, with a view of settling which question, the experiments were undertaken. It then detailed the methods employed for determining the question, as also that of the advantage or disadvantage of adapting to the water-wheel, a circular channel or conduit, extending from the level of the axis to the lowest point, and as constructed, that it should retain the water in the buckets longer than if the wheel worked in a free race; while, by means of screws, it might be withdrawn from the periphery of the wheel during frost, or in case of repairs being needed. From the result of the investigation, it appeared that the author considered Dr. Robinson's views on the subject should receive a limitation, and that a positive advantage arose from the use of the circular channel, varying with the conditions of the wheel, and fall from 3 to 11 per cent. of the total power. These and all the other results of the experiments were given in an extensive series of tables. In the discussion upon this paper, the opinion appeared to be that the modern practice of making water-wheels very wide, so that the buckets were only about one-third full, was, with the good form of buckets now generally adopted, preferable to the use of the circular conduits recommended by the author, to the accuracy and usefulness of whose experiments full merit was accorded.—The meeting adjourned until Tuesday, the 17th inst., when the council and officers for the session would be elected.

REVIEWS.

Examples of Railway Making; which, although not of English practice, are submitted, with practical illustrations, to the Civil Engineer and the British and Irish public. By JOHN WEALE, High Holborn.

As the claims on our columns will not permit space being devoted to so full and descriptive a review of its contents as the importance of the information detailed requires, we cannot do better, in directing attention to this work, than adopt the words of the author, who states the object of his publication to be, the introduction "to the notice of professional engineers, and the commercial and trading classes, the leading principles of a system of railway construction which has not been practised in Great Britain or Ireland, or as yet been sufficiently explained to lead to its adoption by those most interested in the subject." Towards effecting this desirable end two extremely interesting papers are here published—one, a scientific description of the mechanical works on the Ulster and Syracuse Railroad, by Mr. R. F. Isherwood, C.E., of New York, "presented as a valuable and practical illustration of the more economical system of railway construction recently adopted in the United States"—this line, as our readers are aware, affording one instance, out of many in the United States, in which a railway to be worked by locomotive power has been constructed and appointed at an average cost per mile of 30,000l., while that of our railways in Great Britain and Ireland has been about 50,000l., the Belgian 15,000l., and the Prussian about 9,000l. The other paper is devoted to an historical, statistical, and scientific account of the Railways of Belgium in 1842, by Mr. E. Dobson.—To which is prefixed, as "preliminary observations," forty-two pages of valuable remarks and statistical information, the object and tenor of which will be readily understood by the following concluding suggestions, offered "to those who may be more particularly interested in the projects now contemplated for an extension of railway communication in various districts of the United Kingdom"—1. A strict regard to economy as the basis of such constructions; 2. the adoption of such legislative enactments as may best control the expenditure in all its ramifications; and 3. the selection, from the maximum shareholders, of such only as are willing to discharge gratuitously the duties of chairman, vice-chairmen, and directors—assured that by a rigid adherence to these leading principles the success of such projects may be most effectually promoted, and thus produce a happy consummation by the advantageous employment of British capital and by a more general diffusion of means for the advancement of British industry." With that part of the foregoing conclusions recommending the gratuitous performance of important duties, it is well known we do not agree, nevertheless we cannot withhold from the author the credit of having expounded his views with clearness and perspicuity. The profession, and, indeed, the public in general, are deeply indebted to Mr. Weale, for proceeding in his laudable purpose so vigorously, as the spirited manner in which he has introduced these memoirs to the English reader so amply testifies—being embellished by thirty-six well-executed engravings, each descriptive of some peculiar part, machinery, or process, of interest to the engineer or contractor as elucidating the economy of the railway system as adopted in America and Belgium—two countries which have gained celebrity as the nearest approach to our own in exhibitions of scientific progress and mechanical improvement.—We hope the patronage the work merits will be bestowed on Mr. Weale, and that he may be thereby encouraged in favour us with many similar works, as they must prove of paramount importance in developing the progress of continual improvements in railway construction.

A Compendium of British Mining, with Statistical Notices of the Principal Mines in Cornwall; to which is added the History and Uses of Metals, and a Glossary of the Terms and Usages of Mining. By J. G. WATSON.

This little work being professedly a compilation, intended for private circulation, and the object of the writer, as stated in the introduction, not being "to enter into scientific theory or speculation, nor to assist the practical miner, but to give plain facts as they exist," it is evidently placed beyond the pale of the critic's praise or censure; but Mr. Watson's labours being directed to a subject in which we feel deeply interested, and naturally anxious to promote, we cannot help publicly recording our wish that he may pursue his researches and studies, with the view of producing a work, for public use, that we may have an opportunity of expressing an opinion on the publication of a writer, whose object appears to be the diffusion of useful knowledge in connection with this important national interest. Our intention of availing ourselves of much of the statistical information contained in the work is sufficient proof of the opinion we entertain of its general correctness.

APPARATUS FOR GIVING NOTICE OF THE PRESENCE OF CARBURETTED HYDROGEN.—An invention is described in the French papers which will, it is said, give such timely notice of the presence of deleterious gas in mines, or other places, as will enable persons to take the necessary precautions to guard against explosions. An explosion from the admixture of carburetted hydrogen with atmospheric air can only take place when the former exists in a certain and known proportion. When the quantity has reached or exceeded this point, the contact of a light instantly causes an explosion. The instrument recently invented has a sort of tell-tale to show the existence of danger, and is simple, ingenious, and effectual. Connected with a chemical solution is a kind of float, slowly graduated, and attached to a counterpoise. The solution is of such a nature that it undergoes a change when acted upon by the admixture of carburetted hydrogen, and, when saturated to a certain point, the float changes its position, and, acting in its turn upon the counterpoise, a spring is let loose, which strikes upon a bell or drum, giving out a loud sound, and thus indicating the presence of danger. This ingenious test is not liable to derangement, and the whole apparatus is comprised within a small compass, and of little cost. The solution can be varied so as to be adapted to every kind of deleterious gas.

PROCEEDINGS OF PUBLIC COMPANIES.

MINING COMPANY OF IRELAND.

The half-yearly meeting of this company was held at the company's office, on Thursday, the 8th inst.

THOMAS PIM, Esq., in the Chair.

The usual preliminaries having been gone through, Mr. R. PURDY (the secretary) read the following REPORT.

When your board last addressed you a correct estimate of the effect of the new tariff, or scale of duties on importations of foreign ores and metals, could not be formed; but your board ventured to express a hope that by a reduction of rents and other arrangements the altered circumstances in which the mining interests of the kingdom had been placed would be alleviated, so as to maintain those interests in a prosperous state—thus insuring the permanence of the works in which landowners and tenants, as well as the labouring class, are so deeply interested. For so far there has been no disposition evinced to abate the increased rent now charged for Ballinacorney mine, at Knockmahon, where extensive improvements have been heretofore effected. The company's other landowners have granted all that has been required of them, and by a judicious curtailment of expenditure and an altered system of working, rendered necessary by the altered circumstances adverted to, the pressure has been overcome, and your board is enabled to show in the accounts presented an increase of profits amounting to 2,946*l.* 18*s.* 7*d.* in the half year now ended above the amount realized in the previous six months.

Referring to the abstract of accounts for the half year and the auditors' report thereon, your board has only to submit for your consideration the following summary of the result of their workings—Your profit in the half-year amounts to 11,241*l.* 6*s.* 6*d.*, and of which there has been expended in permanent improvements 2,474*l.* 14*s.* 2*d.*, and the balance available for dividend is 8,767*l.* 12*s.* 4*d.* The Knockmahon mines have yielded 4,811 tons of ore, being an excess of 810 tons above the previous return, and the profit has been proportionately increased. The present prospects also are very favourable, especially in the deep level of the Knockmahon part of the district; and although the workings in Ballinacorney have been again interrupted by a flood, or dislocation of the strata, which may cause delay and expense, as has been frequently the case hitherto in this portion of the mines on similar occasions, there is an abundant field for extensive operations in the district, and your board sees no prospect of a diminution of the returns from these mines for a considerable period of time. The company still labours under serious disadvantage in this extensive district by the want of suitable accommodation for agents and workmen, your board having been disappointed in the expectation of a lease of ground for building purposes.

The Silverado collieries have yielded 23,340 tons of large and small coal; of the latter however a considerable part remains unsold, which may be attributed in part to hesitation on the part of the farmers in their late, and perhaps present, state of uncertainty as to prices of produce, which may have prevented the usual outlay in burning lime for manure, hitherto the great source of demand for small coal, called culm, at these collieries. In other respects the prospects are satisfactory; for although the coal was not found at the bottom of the new pit at Mardye for working the second seam, it has been traced to within twenty yards of the end of the level driven from the bottom of the pit, therefore the extent of the fault is ascertained.

The extremely low price of lead has deprived the company of profit from lead mines, except as regards the manufacturing establishment at Ballycorus, where the profit has been commensurate to the work done, the ore being always charged to the works at the price obtainable from smelters at the time of delivery.

At Laganure mines the present prospect is considered very favourable, the lode discovered at the foot of Laganure mountain, intermediate between the old mine and Hagahag, having become productive, and of a most promising appearance. In the past six months these mines have yielded 223 tons of ore.

At Caline and Ballybilly lead mines the works at surface have been impeded by a misunderstanding with the tenant in occupation as to the rights of his landlord, the proprietor of the fee, under whom the company holds the mines. An amicable arrangement, however, is in progress, and the direction of the lode having been discovered at the surface, favourable expectations are entertained of the concern.

Provided improvement in the price of lead shall enable the company to draw with profit the rough material obtainable at these mines, which produced 292 tons within the period of the present account.

The searches at Silver mines have been concluded, and the machinery and mining materials have been removed to Knockmahon mines.

An Act having passed the legislature by which each transfer of the company's shares becomes liable to stamp duty of *one shilling*, similar in amount to the rate payable upon a transfer of real estate, occurring on an average perhaps once in a century, your board has to report that when the bill was before the House of Commons memorials were forwarded on behalf of the company to the First Lord of the Treasury and Chancellor of the Exchequer, praying for exemption from the tax, from which however no relief was obtained, and the tax came into operation on the 1st of October. Your board is, nevertheless, conjointly with the representatives of other joint-stock companies, desirous to press upon the Government—and, if necessary, the legislature—the impolicy of the measure complained of; which tends materially to check the rising enterprise of the country, whilst, from the exorbitant rate of the tax, it must be almost wholly unproductive as a source of revenue to the State.

Your board has only further to recommend a dividend from the profits of the half-year, at the rate of 1*l.* per cent. per annum, payable on and after the 1st February; and that the surplus of net profits be retained for future distribution when the effect of the new scale of duties and the arrangements consequent thereon shall be more fully developed.

A resolution was then proposed and seconded, that the report just read should be adopted and printed and circulated among the proprietors.

Mr. GIBSON said he wished to ask a few questions. It appeared, in the stock account, that a charge of 666*l.* 8*s.* 11*d.* was deducted for the cost of leases from 1836 to 1841. In his opinion the amount ought to have been entered in the profit and loss account, and not as a deduction from stock. Two years ago there had been an excess of profit amounting to 17,000*l.*, which was merged into stock; if this sum had been divided among the proprietors they would have had 3*l.* additional per share to re-invest in the company, and thus diminish the extent to which they would be liable if required to pay up the full amount for which each shareholder was responsible. He also wished to inquire about a sum of 674*l.* for law expenses; as also the proceedings in respect to the Audley Royalties.—THE SECRETARY and CHAIRMAN explained that by the strict rules of book-keeping the sum of 666*l.* first allowed to was properly to be a deduction for stock, for leases were to be regarded as part of the purchase money of property. The account for leases, as also the solicitors' bill, had been most carefully examined by a committee of the directors and the auditors, and the charges were found to be most moderate. The auditors of the company had acted with the utmost liberality. The costs incurred in defending the proprietors' rights as respected the Audley Royalties were likely to be recovered upon a sale of the estate, as the costs in the cause would follow the decree.—Mr. R. TILLY explained that it had been necessary for the company to take some steps to secure the large sum of 10,000*l.*, and legal proceedings were going on almost from the institution of the company. The Messrs. Wallace, the solicitors in the cause for a considerable period, had acted with much liberality, and taken off more from the costs than the master would have done.

Mr. GIBSON then inquired, why between 1800 and 1800*l.* had been expended on the Carrig-castle mine?—THE SECRETARY explained that this sum was mostly for machinery supplied by Mr. Robinson, whose account had not been sent in at the last meeting.

Several PROPRIETORS objected to the course pursued by Mr. Gibson, declaring that the board of directors had justly the utmost confidence of the proprietors, and that the time of the meeting was by such questions wasted.—Mr. PENNY stated that there was a committee of accounts, and after the most rigid inquiry they did not find any charge to which they could object.

After some further questions, which were satisfactorily replied to, Mr. GIBSON moved, as an amendment to the resolution for the adoption of the report, "that the directors' fees be reduced 50 per cent.," which, after some very animated speeches in favour of the directors, was withdrawn, and the original motion carried without a division.

Mr. CHATTON congratulated the company on the very prosperous state of their affairs. The last half-year they were in doubt as to the operation of the tariff, and as to the effect it might have on their property, but the doubts were then removed, and the concern was in the most prosperous condition.

The meeting, after voting thanks to the chairman and directors, adjourned.

THE LONDON JOINT-STOCK BANK.

The half-yearly meeting of the shareholders of this bank was held on Wednesday, the 11th inst., at the establishment in Prince-street, Leith, Mr. AMBROSE MOORE in the chair. From the report it appeared the net profit on the banking operations for the six months ending the 31st ultimo was 19,180*l.* 8*s.* 11*d.*, from which sum it was proposed to apply 16,000*l.* for the payment of a dividend after the rate of six per cent. per annum, and to carry the remainder to the credit of the guarantee fund, which now amounts to 94,620*l.* 17*s.* 7*d.* After a short and friendly discussion between the Chairman, Mr. Knight, Mr. Hughes Hughes, Mr. Mack, and others, the report and accounts were adopted, and a vote of thanks was passed to the directors and managers of the company, when the meeting adjourned.

Mr. JEFFREY'S MARINE GLASS.—As much misapprehension has gone abroad relative to the component parts of this glass, which is supposed by many to be merely common glass and shades, and, as the proprietor makes no secret of the composition, but has thoroughly instructed the men of Woodwick and Chatham dock-yards in its manufacture, as well as us, it may be interesting to our readers to know the substance of which it is composed. A quantity of common glass is selected in nephites, and stiles are added, in proportions varying from one half to three quarters of the solution, according to the degree of clarity required; it is then placed over a fire, and daily incorporated, and applied to the wood to be joined as thin as possible. When large surfaces, such as masts, are to be caulked, the glass is uniformly applied, a heated iron or malletman passed over both faces to bring them to a high temperature, and, when cooled, the joint is complete. To show the elasticity of the composition, a block of old oak, with a coal three-quarters of an inch wide at the opening, and increasing in the form of a wedge, was filled with the glass, and on examination, after sixteen days' exposure to the heat of the building used for burning old ship timber, the opening had increased to an inch, and the glass had expanded in the same proportion, having only a small concavity at the top. Another similar piece was immersed in the most potent, and after sixteen days it was examined, and the wood had considerably enlarged—the glass had, however, given with it, and formed covers at the surface; thus proving that it can retain its elastic and elastic properties under any circumstances.

MINING CORRESPONDENCE.

ENGLISH MINES.

HOLMSTON MINING COMPANY.

Jan. 9.—In the 110 fathom level west the lode is one foot wide, and worth 18*l.* per fathom. The lode in the 100 fathom level west is eight inches wide, and worth 6*l.* per fathom; this level, east of Wall's, on the Holmston lode, and the cross-cut south of ditto, towards the Flapjack lode, are without alteration; in the winze sinking below the 100 fathom level the lode is nine inches wide, and worth 12*l.* per fathom; the lode in the stopes, in the back of ditto, is eighteen inches wide, and worth 34*l.* per fathom. In the eighty and ninety fathom levels, west of Hiltchins's shaft, no alteration since last reported; in the winze sinking below the ninety fathom level the lode has not yet been taken down; in the eastern stopes, in the back of this level, the lode is eighteen inches wide, and worth 39*l.* per fathom; the lode in the middle stopes, in the back of ditto, is still about twenty inches wide, and worth 40*l.* per fathom; the lode in the western stopes, in the back of ditto, is eighteen inches wide, and worth 36*l.* per fathom; in the eighty fathom level east the lode is ten inches wide, and worth 5*l.* per fathom; in the cross-cut at this level nothing new has been discovered during the week; we have now set the men to drive on the branch we interested about three weeks since, as we are not certain that it is not the lode, although small at this place; the lode in the stopes, in the back of the eighty, is sixteen inches wide, and worth 56*l.* per fathom. In the sixty-two fathom level east we have intersected the north part of the lode, but at present find it much disordered, it being split into branches. The twenty fathom level east is suspended, and the men removed to drive the sixty-two fathom level west. The deep adit east and the tribute pitches are much the same.

TINCROFT MINING COMPANY.

Jan. 9.—The lode in the new engine shaft, below the sixty fathom level, is about two and a half feet wide; very throughout, worth 15*l.* or 20*l.* per fathom. The lode in the sixty and east is two and a half feet wide, producing but a small quantity of ore at present; the same level, west lode, three feet wide, worth 15*l.* per fathom, and likely to improve. The stopes in the bottom of the fifty are worth 30*l.* per fathom. The fifty east is unproductive. Since my last, we have holed the winze under the forty to the rise in the back of the fifty—have again commenced driving the fifty and west. No lode taken down this week. We have now set to stop east from the aforesaid winze, where the lode is worth 40*l.* per fathom. The forty and west is at present worth about 20*l.* per fathom, and very promising. The thirty and west of North Tincroft shaft is worth about 15*l.* per fathom, and also very promising. Our tributers are all likely to get fair wages at their respective tributes (as stated in the setting report). At Palmer's shaft, fifty-five fathom level west, we have cut East Pool lode, and I am glad to say it has a very promising appearance indeed. The seventy-two and east, on Highburrow lode, has improved for it since my last; I calculate the end is now worth 20*l.* per fathom. The pitches have also improved for copper. Our prospects, on the whole, are very encouraging.

WEST WHEAL JEWEL MINING ASSOCIATION.

Jan. 9.—We have set Buckingham's engine-shaft to sink below the eighty-five fathom level; the ground in the eighty-five cross-cut is more favourable for driving than when last reported. At the seventy and, on Wheal Jewel lode, the ground is harder for driving, and the lode is worth 5*l.* per fathom; this level is worth 15*l.* per fathom. The fifty-seven and, on this lode, is worth 22*l.* per fathom; the winze sinking under this level is worth 15*l.* per fathom. The winze sinking under the forty-two and is worth 15*l.* per fathom, and the stopes in the back of this level still continue good.

S. LEAN.

TRELEIGH CONSOLS MINING COMPANY.

Jan. 7.—At Christie's eighty fathom level very little has been done during the week, in consequence of the water. The seventy is two feet wide, and worth 5*l.* per fathom. The fifty is worth 4*l.*, and the forty is worth 6*l.* per fathom. At Good Fortune the forty-four and west is three feet wide, and worth 6*l.* per fathom. The thirty-four is worth 5*l.* per fathom. We are stopping the back of the fifty, but the water has been in during the week. W. SYMONS.

TREHOLLAN MINING COMPANY.

Jan. 9.—I have great pleasure in stating that the lode in the bottom of the engine-shaft, sinking below the sixty-two fathom level, is very much improved. The lode in the sixty-two and east is looking well, and the lode in the fifty fathom level east also presents a very favourable appearance. We have already passed through twelve fathoms of ore grown at the sixty-two fathom level, and, taking the mine altogether, I think she never looked better than at the present time.—I cannot furnish you with any particulars respecting the lode in the shaft, as we have not yet done sufficient since the change took place to enable me to do so.

J. NEMER.

TREHOLLAN MINING COMPANY.

Jan. 9.—The lode in Henwood's shaft, sinking under the forty fathom level, is eighteen inches wide—good tribute ground. The lode in the forty fathom level, east of Henwood's shaft, is one foot wide—very good tribute ground; ditto, west of Henwood's shaft, is nine inches wide—good tribute ground. The lode in the thirty fathom level, east of Henwood's shaft, is one foot wide, producing a small quantity of ore. We have not discovered any more lode in driving south on the cross-course at this level. The tin lode which we are stopping in the back of the adit, east of Morcom's shaft, is much the same as last reported.

UNITED HILLS MINING COMPANY.

Jan. 7.—Seventy fathom level, East of Williams's Shaft—Lode three and a half feet wide, two feet on the south part of fair quality; ditto, west of ditto, lode three feet wide, producing but little ore. Sixty fathom level, east of Eastern Shaft—Lode four and a half feet wide, fifteen inches good ore; ditto, west of Diagonal shaft, lode four and a half feet wide, producing ore throughout, but not rich. Fifty fathom level, east of Eastern Shaft—Lode four feet wide, two feet of good quality. Forty fathom level, east of Eastern Shaft—Lode three feet wide, producing some good stones of ore; adit end west, at Wheal Sparrow, the lode is three feet wide, producing some ore, with a promising appearance; western shaft, sinking at ditto, lode two feet wide, one foot on the north part good ore. At James's shaft, sinking under the fifty fathom level, lode three feet wide, one foot on the north part producing good ore.

N. LANGDON. S. H. FRASER.

BEDFORD UNITED MINING COMPANY.

Jan. 10.—I beg to hand you my report of Wheal Marquis. In the forty fathom level east the lode is about two feet wide, and of the same character as last reported. At the thirty fathom level it has been thought prudent to suspend it for the time. In the shaft sinking on the eastern part of the mine the lode is two and a half feet wide, composed of greenish, spar, muddle, grey and black spots of yellow copper ore, and worth about 20*l.* per fathom. The pitches remain without alteration. The surface arrangements, erection of wheel, &c., are progressing with great vigour.

J. PHILLIPS.

CORNBURGH MINING COMPANY.

Jan. 9.—We had the north lode in the seventy fathom level one foot and a half wide, principally composed of muddle; not having found the lode of this nature in the levels above, whilst passing through the unproductive ground, we anticipate the change favourable for the productive ground. We have just cut out through Chiverton lode, and find it much the same character as the north lode, but the latter is the most favourable for driving. The fifty fathom level has much the same appearance as reported last week, yielding a little lode. The lode in the fifty and, west of Murray's shaft, is one and a half feet wide, composed of broken and spots of lead.

J. WARR.

TANAR SILVER-LEAD MINING COMPANY.

Jan. 9.—In the 120 fathom level the lode is intersected with a wide course, which, for the present, has disordered the lode. In the 115 fathom level the lode is about eighteen inches in width, still producing good work, and a promising level. In the 105 fathom level the lode is from two to three feet wide, of a very promising appearance, and producing rich ore. In the ninety-five and the lode is two feet wide, saving work. In the eighty-five fathom level the lode is from six inches to one foot wide, producing good stones of ore, and looking favourable for a further improvement soon. In the seventy-five fathom level the lode is one foot wide, of just the same quality and appearance. In the sixty-five fathom level the lode is eighteen inches wide, producing some good work. In the fifty-five fathom level the lode is small, and producing but a small quantity of ore. In the forty-five fathom level the lode is also small and unproductive. At the north mine the engine-shaft is now down about twenty-four fathoms below the adit; the ground at present is rather harder for sinking.

JAMES BRADGEE.

FOREIGN MINES.

IMPERIAL BRASILEIAN MINING ASSOCIATION.

Guapá River, Oct. 22.—The mine continues to produce the same poor appearance it did when I last addressed you. Gold has been seen occasionally in the vein at Curia's, between the thirty-four and forty-one fathom levels, but no work was obtained for the working-horse. A reference to the gold returns will show, I am sorry to say, a falling off in the stamps produce for the last ten days.

Gold Report.—From 18th to 22d Oct. (nine days), 13 lbs. 2*oz.* 6 dwt. Total from 1st July to 22d Oct., 239 lbs. 4*oz.* 17 dwt.

BRASILEIAN COMPANY.

Cuba Branch, Oct. 24.—The gold report for the past week still continues much under the mark, and, as a very fair proportion of the bottoms has been sent out, I really cannot hold out any hope of an improvement; nevertheless, I will repeat, that the lode, in my opinion, is of so promising a nature as I ever saw it; and I will add, that the poor produce which we have had from it, is, in my view, a marvel. Much trouble has been experienced lately by the shaft, from the number of floors which have been sent, through which the powder has blown away without doing more than banking the ground, and, consequently, obliging it to be worked out. It is my belief that we are not

far from a main floor, and I am very anxious to see the stone under it. I hope the new engine-shaft will be holed to the thirty fathom level in ten days, and in ten days more the new 10-inch plunger fixed there; this will remedy many inconveniences, and enable us to drive immediately from the lode west of the cross-course—a most important point. The Babu (San Antonio) is still poor, but so just opinion can be yet formed as to how these lodes will answer; and I regret to say, that, I fear, we shall not be able, just now, to prosecute the trial further—the heavy rains causing the Cata Branch stamps to do so much dust, that every man is required to break stone for them.

W. COTTEWORTH.

Gold report for two weeks to 21st Oct., 26 lbs. 9*oz.* 11 dwt. 15 grs.

RIVER WANDLE WATER COMPANY.

The importance of, and necessity for, an ample supply of pure and wholesome water for the purposes of this vast metropolis, has long occupied the attention of Parliament, and is now fully felt, and universally admitted, by the community at large. That this supply cannot be effected by resorting to the river Thames, has been clearly demonstrated by the reports of the Parliamentary committee, and by the opinions of Dr. Roget, Dr. Horsley, Prof. Faraday, Mr. Brande, Mr. Telford, and other scientific gentlemen, who have given evidence on this subject before the various committees of the House of Commons. The report of the select committee appointed to inquire into the present system of supplying water to the metropolis, under date July, 1839, says, that the river Thames, as it approaches the metropolis, becomes loaded with a quantity of filth, which renders it improper to be employed in the preparation of food, &c. That it is obvious, that water receiving so large a proportion of foreign matters as it is known that they way into the Thames, and so far impure as to destroy fish, cannot, even when clarified by filtration, be pronounced entirely free from the suspicion of general insalubrity. The present state of the supply of water to the metropolis is insupportable of, and requires improvement—that many of the complaints respecting the quality of the water are well founded—and that it ought to be derived from other sources than those now resorted to, and guarded by such restrictions as shall, at all times, insure its cleanliness and purity. The water was, at the time quoted, supplied by the West Middlesex, Grand Junction, Chelsea, New River, East London, South London, Lambeth, and Southwark Water Companies. The committee further approved of the opinion of the commissioners, that the supply of water for the metropolis, including the borough of Southwark, and the adjacent parishes, should be derived from a pure source than it is at present, and recommended that Mr. Telford should proceed with making such surveys as should be necessary. It has been decided, that filtering the water has but little effect as to rendering it wholesome, as is proved by the evidence of Mr. R. M. Kerrison, M.D., in his examination before the committee in 1828. He then stated, that the filtration of the water will render it tolerably free from mechanical matters that are suspended in it—and, certainly, water in that state being the best that can now be obtained, is very acceptable—but his objection goes to the fact of taking water which has been mixed with objectionable things, when it is a matter of doubt whether all those objectionable things can be fairly separated. Accordingly, as required by Parliament, Mr. Telford made a survey, and fixed upon the river Wandle, as stated in the evidence given by him to a committee of the House of Commons in 1839. He says:—"The best means of obtaining an ample supply of pure and transparent water, is by taking it from the river Wandle at a sufficiently high elevation, which is found on the Croydon branch of that river, at the east end, by means of an aqueduct, which may be carried in nearly a direct line to Clapham Common, and there terminate in a requisite number of reservoirs, at a height of eighty-two feet above the high-water mark in the river Thames, which exceeds the present height of delivery by the several companies. The main branch of the river Wandle takes its rise in a singularly copious spring in the vicinity of Croydon, and, after pursuing a westerly course for about three miles, is joined by the Carshalton branch, which likewise derives its origin from several plentiful springs in that neighbourhood. The water of this river possesses, at all times, an uncommon degree of purity, retaining its transparency after the heaviest rains in the course of a few hours. The quantity of water flowing down the Carshalton branch of the river Wandle, in the extraordinary dry season of 1833, was at the rate of thirteen cubic feet per second; the quantity discharged by the Croydon branch, at the same time, was at the rate of seventeen cubic feet per second. From this last he proposed to take thirteen cubic feet per second, being four and a half cubic feet per second beyond the present maximum demand in the middle of summer." Mr. Telford recommends the total discontinuance of the use of the Thames water, and states that the compensation to be made for the damage occasioned by the removal of the sources of irrigation, &c., to the proprietors in the neighbourhood of the river Wandle, would be very slight, as he saw no signs of such a use being made of the waters. He had selected that river because he considered it far superior to the river Thames in quality, being perfectly transparent, and, from the best evidence he could obtain, was generally so; even after a flood, in a few hours it became perfectly pure again. The analyses made by Mr. W. West and Dr. Horsley, of the water from the various sources from which the metropolis is supplied, and given as evidence, show the Wandle water to possess a great advantage as regards purity and adaptation to domestic purposes. The raising of the water rates—in many cases from 100 to 200 per cent.—by the companies at present supplying this indispensable article in the boroughs of Lambeth and Southwark, have at length awakened the inhabitants to a sense of their own interests, in having not only a purer article, but, at the same time, that article supplied at a cheaper rate. Public meetings have, in consequence, been held in the boroughs of Lambeth and Southwark, at one of which a committee was appointed to inquire into, and report upon, the best means to be adopted for procuring a sufficient supply of this necessary element on the most reasonable terms. After due investigation, the committee have determined upon recommending the plans of Mr. Telford, and to take the supply from the source of the river Wandle, at Beddington, near Carshalton Park. It is, therefore, proposed to raise a capital of 250,000*l.*, in shares of 10*l.* each, which will enable all ratepayers to take an interest in the undertaking. The profits of the shareholders are not to exceed 10 per cent., and any excess of profit is to be applied to the reduction of the rates. The necessary notices have been given, and the plans for taking the water at Beddington have been in compliance with the standing orders of the House of Commons, deposited so as to enable the subscribers to apply to Parliament in the next session. As respects the superior purity and brilliancy of the Wandle water, as compared with the water supplied by the companies to the inhabitants of the Surrey side of the Thames, and even to spring water, we can bear testimony, the Wandle water being perfectly clear, and without colouring or sediment, while that from the Thames is clouded, and has a fatty sediment. The spring water, although when sent by itself, is apparently perfectly bright and colourless, when placed on a sheet of white paper beside the Wandle water, showed in a disadvantage, it having a pale brown colour, while the latter was perfectly bright and colourless.

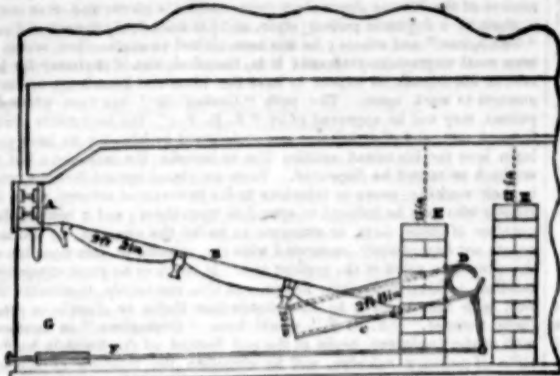
With respect to its adaptation to domestic purposes, its superior softness is fully apparent, as a proof of which we need only refer to an experiment made with soap, the same quantity being applied to each of the waters. The Wandle water became milky, and, after standing upwards of forty-eight hours, the period at which we are writing, showed no alteration or appearance of curd, proving that the soap was completely held in solution. The Thames water showed the same milky appearance, but in a short time the soap curdled and floated to the top of the vessel, some portion remaining at the bottom, in the form of crystallization, which appearance it has at this present moment. The same test applied to spring water taken from a pump in the neighbourhood, produced very nearly the same effects as in the Thames water. These experiments may be seen at the office of the River Wandle Company, 64, Blackman-street, Southwark. We understand that a meeting of the coffee and eating-house keepers, and which will be open to the inhabitants generally, is to be held at the Bridge House Hotel on the 19th inst., to propose further resolutions in support of this company, and we earnestly recommend the public generally to make a point of attending this meeting, to further so great a desideratum, both as regards health and economy, as a beautiful and cheap supply of the best necessary of life.

WRIGHT'S PATENT DRAG.—By the use of this invention, which can be applied to any description of carriage at a moderate cost, the great object so long sought by the driver, of obviating and unobscuring the wheel without moving from his seat, is effectually accomplished. The said drag is fixed to a double-jointed lever, attached in a four-wheel carriage to the hind axle; from it a strong chain passes to another lever under the driver's seat, to which also a strap is continued, where it passes over a small barrel with a wheel handle; besides this there are two lever handles, over which the right hand has complete control; on raising one of these handles the said drag is instantly placed firmly under the wheel—the other, when lifted, releases the chain, and the wheel passes completely over the said drag; the wheel is then turned three rounds, and the lever (on the axle), with the said drag, is raised to its original position. To all persons in the habit of driving, the utility of this arrangement must be apparent; in cases of horses taking fright, or when among hilly roads, the application of this drag must prove a great prevention from accidents; it also saves much time, and when, on arriving near the bottom of a hill, the wheel can be unfastened in an instant, without stopping to back the horse, or move from the seat; the momentum of the carriage is maintained, the animal relieved from the jolts consequent on the old method, and the pleasure of his load increased. The apparatus is perfectly neat, and does not, in the slightest degree, disfigure the appearance of the most elegant coach. Upon the whole, it is thoroughly effected for the purposes in view, and we think need state any very extensive use.

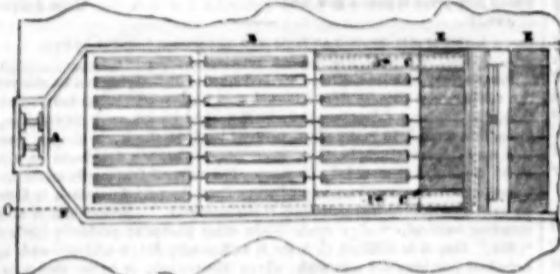
PREVENTION OF SMOKE AND SAVING OF FUEL.

We last week adverted to the patent of Mr. Joseph Williams, or rather that secured under the name of André Kurtz, having for its object the decomposition of the gases, and prevention or consumption of smoke, and now propose entering into a description of the furnace as presented to us in the *Urgent* Government steam-vessel, now lying at her Majesty's Dockyard at Woolwich, the information we have acquired being derived from Mr. Joseph Williams, Captain Emerson, and Mr. Elliot, the engineer; and which, to render more clear to those who are unacquainted with this description of furnace or machinery, as also the difference existing between the patent of Mr. J. Williams (Kurtz) and Mr. C. W. Williams, we have illustrated by diagrams:

Longitudinal section of furnace.



Ground plan of furnace.



DESCRIPTION.

- A—Furnace door, or charging place.
B—Continuity of furnace-bars, entire length 6 ft. 6 in.
C—Air passage, or flue; eight inches by two inches interior, whereby the air from the ash-pit becomes heated, and passes into the space between the fore and hind departments of the bridge—metal one inch.
D—The valve acted upon by lever (F) for regulating the distribution of air to furnace.
E—The brickwork of bridge, nine inches each in thickness, the intermediate space of nine inches being for the passage of the heated air from C.
F—The lever, or rod, for regulating the admission of air by means of the valve.
G—The ash-pit.

On referring to the above plan and section, as taken from actual measurement and observation, made on a personal inquiry last week, it will be observed, that the declination of the bars, from charging place to the bridge, is at an angle of about twenty degrees, the bars being 2 ft. 2 in. in length—thus making the whole length, or range, of the furnace 6 ft. 6 in. to the bridge. The mode of introducing the heated air is shown at C, where a pipe, or passage, being eight inches in depth by two in width (one inch metal), is placed on either side the furnace, thereby displacing the furnace bars, as shown in the ground plan—thus conveying the air from the ash-pit through these heated pipes to the bridge, the pipe, or passage, being at about a like angle of inclination, crossing the bars in its admission of the air. The air from the ash-pit, thus traversing through the heated passage (C), is allowed to escape, or is rather regulated in its emission by the valve (D), which, passing up the vacuum formed between the front and hind portion of the bridge, at once commingles with the gases. The lever (F) represented shows the means by which the valve is regulated, as to the admission or dispersion of air.

Having thus described the modification of the patent as applied to the *Urgent*, the question which arises, how far it answers the purpose? and, moreover, with reference to the discussion in our columns, whether such is an infringement on the patent of Mr. C. W. Williams? We will, then, first state the result of our inquiries as regards the process or invention applied to the *Urgent*, and then proceed to inquire how far the two patents have reference to each other. It appears, then, from the inquiries instituted, that the *Urgent* during the past thirteen months, saved about 600 tons of coal in 111 trips, the usual quantity used before the introduction of the patent being forty-five tons the trip, while, since the application of Mr. Joseph Williams's (Kurtz) patent, the consumption of fuel has been reduced one-ninth, or five tons per trip. It is stated that during the first seven months, a saving of 400 tons 6 cwt. was effected; but, as the Government does not allow an engineer's log to be kept (we presume on the score of economy) for the past six months, there is no documentary evidence to refer to, therefore we have taken the oral evidence of the engineer, from which we gather that the saving during the entire period was that already mentioned—about 10 to 11 per cent. With reference to the question, as regards the difference, if any, existing between the patent of Mr. C. W. Williams and that of Mr. Joseph Williams (for, as regards his claims on, or differences with, Mr. André Kurtz, it is no matter for us to consider), it is right that we should direct attention to the prominent features which present themselves in the two respective patents, specifications of both of which are now before us.

Mr. C. W. Williams's patent has for its object the dissemination of atmosphere, or cold air, in flues, or jets, whereby, diffusing itself with the gases, a combination takes place, which has the effect of economising fuel, and the prevention of smoke. Mr. C. W. Williams claiming the admission of atmospheric air through whatever apertures he might think fit to adapt at any part of the flame bed, or before or after the bridge, so that the air admitted is in minute particles, so as to mingle with the gases. Mr. Joseph Williams's (Kurtz) patent appears to us to be so far different, that, instead of diffusing the cold air through the flues, valves, or apertures, contemplated by Mr. C. W. Williams, he at once introduces hot air (the heat being generated in its passage from the ash-pit to the "split bridge"), through two passages already described, whereby it commingles with the gases, or comes in contact with the flame—Mr. Joseph Williams using, however, a valve for regulating the quantity of hot air required, as shown in the diagrams; and, as we are further given to understand, the space between the two portions of the bridge being contracted at the upper part, so as better to regulate its passage.

Thus, it would appear that while Mr. C. W. Williams introduces cold air through small apertures by way of jets, Mr. Joseph Williams admits himself of hot air in columns, merely regulating the heated air by the valve already mentioned. We have referred to the specification and original drawings appended to the patent of Mr. A. Kurtz, and we are bound to state that there is a dissimilarity between the drawings and the diagrams here given, inasmuch that Mr. Kurtz does not show any valve or lever as above described, nor is the angle at which his bars are placed in a like position. This is, however, a question for patentees, and not for us to discuss. We have given the result of our observations on Mr. Joseph Williams's patent or application of heated air to the boilers of the *Urgent*, and shall be glad to be set right, if that we have, in the slightest respect, committed any error. We do not interfere with the question between Mr. Joseph Williams and Mr. Kurtz, while at the same time we cannot but express our opinion that it is immaterial to the one or other, if not both, to explain their relative positions, and not allow paragraphs to appear, reflecting on the character of one of the parties, and such to be allowed to pass uncorrected and uncontroverted. We presume Mr. Joseph Williams, if not Mr. C. W. Williams, will notice this article in our next, and, wishing to have the subject well understood, we leave the question, with that of Mr. Billingsley's application, or infringement, until an early Number, when we hope this long-continued question will be brought to a close.

NARROWS FURNACE.—During the recent Session of the Peace for the county of Durham, an indictment was preferred before the grand jury, charging Messrs. Cookson and Co.'s Alkali Works, near South Shields, with being a nuisance to the inhabitants of that town. The grand jury returned a true bill, so that the case will probably come on for trial next session. (In our next we shall give a description of Messrs. Hudley and Radcliffe's ingenious invention, with drawing and specification, by the adoption of which the injurious effects arising from alkali, metallic, and other chemical works will be effectually removed.)

ORIGINAL CORRESPONDENCE.

RELATIVE MERITS OF THE HOT AND COLD-BLAST PROCESS.

TO THE EDITOR OF THE MINING JOURNAL.

SIR,—I am invited by Mr. George Crane, in your last publication, to provide one hundred and fifty pounds (he offering to furnish the like sum, instead of fifty pounds, his first subscription) towards an inquiry which the Society of Civil Engineers is to be requested to undertake into the relative merits of irons made with hot and cold-blast and anthracite coal; and Mr. Crane proposes that he and the agents of the Ynisdwyn Company shall have free access to these works during the investigation, offering the same admission to the Ynisdwyn Works to me and the agents of the Ystalyfera Company.

I am sensible of the importance a special inquiry made by the Society of Civil Engineers would give to anthracite iron, and I have so many accumulating proofs of the surpassing merits of that made by cold-blast at the Ystalyfera Works, that my conviction is, that any and every fair inquiry must enhance its value in public estimation. Whilst, therefore, with the thrift induced by pinching times, I feel one hundred and fifty pounds to be a large sum only to be expended on an object of decided utility, and whilst I have no intention to set up my purse against Mr. Crane's, or to go on offering increasing stakes with him as a proof of confidence in the iron I manufacture, yet I am willing to contribute the large sum named, for the purpose and in the manner stated; or, as an amendment, to agree that he shall pay the whole expenses whose iron is found the weakest.

I suppose Mr. Crane—as he has so shortly dispensed with the important aid of Messrs. Mushet and Fairbairn, to whom we can hardly refer, is well warranted in thinking that the Society of Civil Engineers will undertake the inquiry into the properties of anthracite iron; yet I cannot but regret that with such a competent tribunal, what was first started by you, and to which my subscription was given, as a general examination into all the varieties of iron made in this country, should have become a mere question between the Ynisdwyn and Ystalyfera Iron Companies' manufacture. I fear, also—considering the close neighbourhood of these rival companies, well known not to be on terms of cordiality—the proposed inquiry, so limited and contracted, can hardly be carried through with temper. I think it right to express so much, lest public expectation should be disappointed in the result.

In the agent I have thus given to Mr. Crane's second proposal, I have acted in the belief that there must be some mistake in the intimation I have received from him, since I last addressed you, that he had instructed his solicitors to commence immediate proceedings at law for the recovery from my partners and self of the profits and benefits of our former use of the hot-blast process. From the fair and candid spirit of Mr. Crane's letter, I am sure he would neither make a public challenge, which he knew I was precluded by legal proceedings of his own from accepting, nor would seek access to these works under any pretence whilst intending to establish a case at law against us. If, however, Mr. Crane has inadvertently overlooked the circumstance I have reluctantly alluded to, and if the very subject, he proposes should be investigated as a matter of science, is about to be inquired into in a court of law, I can only regret such an unfortunate oversight on his part; as, on reflection, he must feel how incompatible are the circumstances, and how necessary it is for me to see that the legal position and interests of the Ystalyfera Iron Company are provided for, before I throw open these works, as suggested by him. It is not a very improbable contingency, that a natural bias might convert the agents of the Ynisdwyn Iron Company into not perhaps quite impartial witnesses in a court of law. Mr. Crane will, therefore, doubtless direct his solicitors to give our legal advisers the necessary assurances; and, relieved from this question as a matter of law, I shall eagerly enter into it as a matter of scientific investigation and of legitimate and laudable competition. If, on the contrary, Mr. Crane contemplates a legal process against us, I consider his conduct contradictory, and shall decline pursuing this subject further in its present shape.

I am glad, in conformity with your wish to be informed how our new large furnace works, to say that, from present appearances, the increased dimensions promise to be of material advantage, and that, with my cold-blast process, furnaces of the largest size may be worked with the anthracite coal alone.

J. P. BUDG.

Ystalyfera Iron-Works, Swansea, Jan. 10.

BLACK-BAND IN STAFFORDSHIRE.

TO THE EDITOR OF THE MINING JOURNAL.

SIR,—I have received the specimens, raw and roasted, of the ironstone forwarded to you by your Staffordshire correspondent, and which you have thought proper to refer to me for my opinion. I have no hesitation in pronouncing them to be black-band, or carboniferous ironstone, identical in every respect with the Scotch, and of equal quality. This is not, however, the only black-band that has passed through my hands from Staffordshire. It is found on Lord Lichfield's property, in some mining ground belonging to Messrs. Thornycroft, and also near Newcaston, in North Staffordshire. I expect to be able to send you this week the result of some experiments made with the Beaufort black-bands, Nos. 1, 2, and 3.

Coleford, Jan. 11.

DAVID MURPHY.

BLACK-BAND IRONSTONE.

TO THE EDITOR OF THE MINING JOURNAL.

SIR,—In a recent Number of your Journal the following concise and emphatic communication appeared, signed J. and C. Bailey—

"We beg leave to set Mr. David Mushet right respecting the discovery of the black-band ironstone at Nantyglo and Beaufort Iron Works. We have worked it at Nantyglo for the last twenty to twenty-five years—at Beaufort since Aug. 1, 1850."

Now, on examination, I find that the vein thus worked at Nantyglo consists merely of common argillaceous ironstone, which, consequently, Messrs. Bailey have mistaken for the carboniferous black-band. With this remark, I leave it to your intelligent readers to decide how far Messrs. Bailey are qualified "to set Mr. D. Mushet right."

Jan. 10.

ROBERT MURPHY.

COLD AND HOT-BLAST IRON.

TO THE EDITOR OF THE MINING JOURNAL.

SIR,—I have had my attention directed to a long letter in your Journal of the 31st ult., signed Henry Hartop, and I suppose written by that various individual. I pretend not to enter into the merits of the question at issue between Messrs. Graham and Co. and himself, but if all his other statements are of equal value with the last half-dozen lines in that letter, there is not, I think, much dependence to be placed on his experiments. He says—"The other (letter) from a person who had to do with contracting with Messrs. Graham and Co. for their supplying a very great quantity of castings and other iron work at a very low price, after which, the least he could do under the circumstances, was, to say that such castings and iron were of good quality, or what would the original contractors have said?"

In reply to this silly insinuation, allow me to say to him, that I am not a person who had to do "with contracting with," but was simply the agent for the original contractor of the works I named in my letter to Messrs. Graham and Co. (and which I observe is published in the *Mining Journal* of the 7th instant); I never contracted with Messrs. Graham for "a large quantity of castings at a low price," nor for any price at all. I never had any of their castings but waggon-wheels, barrow-wheels, and such small articles; I never had any other iron-work at a very low price from them, but generally paid them a higher price than I could have procured the articles for elsewhere, just because I considered their iron better than I could get elsewhere, and, consequently, cheaper in the end; I paid them 12s. per ton for iron rails for temporary purposes, and 16s. for a large quantity of iron 21 inches diameter. Surely, Mr. Hartop will not call these very low prices, and, in fact, the only fault I ever had to find with the iron I got from Milton Iron Works, was the high price which I thought they charged for it. Allow me to say, that I have no interest, and that I feel no interest in the matter in dispute; hot and cold-blast are alike indifferent to me, but I cannot allow a man of Mr. Hartop's stamp to impugn my motives, or question my veracity, without an attempt to defend myself.

Ledsa, Jan. 11.

SAMUEL HORN.

COLD AND HOT-BLAST IRON.

TO THE EDITOR OF THE MINING JOURNAL.

SIR,—"Alpha," in his letter to you of the 25th of November, agrees with me, that the experiments of any individuals upon their own iron, as compared with that of others, are of no worth, and ought not to be published with a view to the settling this question; and, by the same rule, I should now doubt all experiments made on iron manufactured for the purpose of being experimented upon with that view. If "Alpha" ever read my paper, in your Journal of the 6th of August, he seems to have either forgotten or overlooked the very important fact, that all the experiments therein named,

except the last, were not mine, but those of gentlemen, not ironmasters; and, therefore, his comparison between Messrs. Graham and Co. and myself stands for nothing, and will, I think, do away with all cause for further trials on the subject, and particularly when it is remembered that, on a fourteen years' trial, the difference of price in the market, between cold and hot-blast iron, cannot but stamp the new process as a total failure.

If "Alpha" will refer to my paper of the 24 of August, he will there find an abundant reason why the Elsecar iron should not have been compared with that from Milton, in Mr. Fairbairn's first tables; and if he looks at that gentleman's last tabular statement in the column—of all others by far the most important to the public of its whole contents—namely, the power to resist impact—it will be seen, that while the Elsecar cold-blast iron is one of the two highest in that column—viz., 992 lbs., the Milton hot-blast iron, made with the same coal, ironstone, and limestone, is only 538 lbs., or the lowest but four of the forty-nine experiments therein named; when this is seen, probably the observation of men's prejudice carrying them the "whole hog," in this instance may not be applicable as the "whole hog."

We are next referred, as a proof that hot-blast iron may be used for works of great strength, to the beautiful bridge that carries the Midland Counties Railway over the Trent, made at the Butterley Works, of hot-blast iron; it is, however, equally notorious that bridges can be made beautiful at those works of hot-blast iron, but beauty and strength are two different questions; and it will not be denied, that a bridge may be made strong enough of hot-blast iron, if you use plenty of it, and go also to the additional expense of making the masonry strong enough to support it; but the original saving of 12s. or 13s. per ton on the iron will be very small, as compared with such very considerable extra costs; and although the abutments of the bridge in question cannot speak, the one on the Sawley side of the river will show much to those curious in such matters. In calling attention to the aqueduct which carries the Aire and Calder Canal across the River Calder, at Stanley Ferry, "Alpha" has forestalled me of a rich specimen of a large work on my side of the question; and an examination will show him a very considerable number of flanges and castings broken under the operation of putting it together; and, as a large portion of the flanges are immersed in the water of the canal, probably Mr. Horn (agent and manager to the original contractor for the work from the Aire and Calder Company) may be able to speak to what cannot be seen; indeed, it would only have been candid in Mr. Horn if he had alluded more particularly to this aqueduct in his testimonial of the good quality of the Milton hot-blast iron. The bridge and massive dock gates at Goole I have not seen in their places, and do not doubt their doing their work, although it may be with the help of an excessive quantity of iron and a proportionate quantity of masonry; at all events, if public opinion may be trusted in such an important matter, the sub-contractor made no little sacrifice to get quit of so great a weight of the valuable produce of his hot-blast.

If "Alpha" thirst for information on this subject should take him to inspect the aqueduct in question, he cannot do better than visit Leeds, and, on calling at the iron-works there, he will, on inquiry, find that the iron portion, having originally been the produce of hot-blast, the engine, with every wheel, plunger-block, and shaft, has been broken, and replaced by others of cold-blast iron—the expense of doing which has, I should think, been, with their attendant hindrances, almost incalculable; and, indeed, if in this neighbourhood, and "Alpha" should wish for further proof on this subject, he cannot do better than call at the Milton Iron Works, where, if truly informed, he will find that, some time ago, on accidentally breaking the driving shaft of their large forge hammer, after having been some years at work, five others were cast, one inch larger in diameter, of their own hot-blast iron, all of which broke in succession within eight weeks; at the end of which time one was made of cold-blast iron, and stood its work well. "Alpha" will not, then, say that hot-blast iron was not found wanting; and where is the boon to the ironmaster, who, for a saving of 12s. or 13s. per ton, reduces the value of his produce 30s. per ton in the market? With all these facts looking us full in the face, will "Alpha" yet say that iron is not deteriorated by the use of heated air?

I am glad of James Beaumont Neilson having "Alpha's" best wishes, and I take this opportunity of tendering mine also, but not as the discoverer of the use of heated air in the blast-furnace; that, if I have not long been misinformed, belongs to the name of Hotfield—a name of long and high standing in the British iron trade, and whose great merit, I think, lay in his abandoning his new scheme as soon as it was found to injure the quality of his produce: the effect of which judicious abandonment, I trust, Mr. Hotfield has long and profitably enjoyed, as I find his pig-iron is now selling for 5s. per ton in the market, and hot-blast iron at 2l. 7s. 6d. per ton. Should I have failed to convince any of your readers as to the very abundant reasons for this difference in value, I must beg of such to read over, with attention, the very practical and independent letter of Stephen Kish, in your Journal of the 24th of last month.

"Scotus's" letter of the 5th of December, I think, so effectually answered by "A Keeper's" letter, dated Sheffield, 13th December, as to leave little for me to say, except I think it probable that, unless either his additions or his furnace is better looked after, it may prove all the worse for the young "Scotus's."

"Omega's" letter, of the 14th of December, next claims my attention, and, I must say, that our conclusions are pretty much in union; as regards his disagreeing with you on the *trial commission*, I think that day now gone by (except as to anthracite iron), and that, in all future trials, those with the least principle will stand the best chance—a state of things which should not be. You, Sir, think "Omega" is an ironmaster, and of which I have little doubt; I do not, however, comprehend his meaning as to civil engineers and gas directors concurring between hot and cold-blast, unless it is on his discovering that the too common and disreputable trick is drawing fast to its close, of ironmasters and founders, under the influence of a bribe to engineers and directors, being able to get pipes and other castings received made of hot-blast iron, under a contract, in which cold-blast iron is expressly stipulated for. "Omega" may depend upon it, the question is become both too well understood and too serious for that sort of thing to go on much longer. There cannot be a doubt as to the degree of credit being given to all productions, in proportion to the standing in society of their authors—and it is on that ground I form my opinion on such questions as I think it worth my while to give myself any trouble about; and as to the particular question now under discussion, if "Omega" will give himself the trouble, he will see in my letter, in your last week's Journal, that my opinion on that subject has, at least, been built on a good foundation, inasmuch as the results favourable to cold-blast iron are from the experiments of five different parties, of undoubted credit, and altogether independent of this question, against one experiment made by parties on their own iron, and who, to say the least of it, are very very much interested in the result; and I do not think the cause of hot-blast iron will be very much advanced by any of its advocates (however highly they may think of themselves) descending to call names, that being well understood as the most decided symptom of the last degree of weakness in argument on all subjects. I can, with great safety and satisfaction to myself, leave it to your readers and the public to supply the only name applicable to one who can stoop to promulgate abuse under a fictitious signature; I should, Sir, have been sorry to have fouled my paper or your columns with it; and, I must add, I do not think you justifiable in having given room for "Omega's" letter under such circumstances.

Barnborough Hall, Rotherham, Jan. 7.

HENRY HARTOP.

RELATIVE PROPERTIES OF HOT AND COLD-BLAST IRON.

TO THE EDITOR OF THE MINING JOURNAL.

SIR,—In your last, I perceive a letter from Mr. Henry Hartop, on hot and cold-blast iron, wherein is stated the strength of Fensky cold-blast, and Flenkynston hot-blast iron, and stating they were made in the same coal-field, and of the same materials, which, I beg to say, is not the case. The coal and ironstone got at Flenkynston, and used in making iron there, not being at the Fensky at all. Being a resident near the Fensky, I can prove that they never used any of the materials used at Flenkynston, but it is probable Mr. Hartop is led by the experiments made by Mr. Fairbairn on fifty different irons, and in all the cases mentioned, the iron was sent for that purpose by their respective makers. Now, as regards the Flenkynston iron, it was sent to Manchester for quite a different purpose; as I sent five tons of a peculiar iron to E. Blackley, Esq., of Manchester, which he saw at Flenkynston, which he, as well as myself, supposed that the British Association would be able to inform us what were the component parts of that iron; and as I gave to Mr. Blackley the promise by which the iron was made, we were desirous to know what caused it to be of that peculiar property, but what was my surprise, when I had the list of compo-

iments made on iron sent me, of finding the iron sent, was tested to ascertain its strength, when I wanted no such thing, but its component parts and chemical properties discovered. Had I wanted to test the strength of the Flacknaston iron, I should have directed most certainly that the iron usually made there, should have been tried, as, at the same time I sent this peculiar iron, I had sent with it five tons of iron made at the same place with hot-blast, as strong as any ever made at the Pockley with cold-blast, and when Mr. Buckley saw my men break some of this iron, we had some of the Pockley iron broke also, and could not perceive any difference as to strength. From the above facts, I am inclined to suppose that there has not been sufficient data given to start from, in making the experiments on the strength of iron, as probably this, as in other respects, has led to errors in the conclusions, and are not to be relied on as correct. As I have not seen any account of any experiments made on the strength of iron, commenced on data that is likely to be generally useful in discovering the strengths of iron, I might, at a future time, state, for your insertion, my ideas of the formulae that should be entered into at the works, and, after this, the formulae at the remitting for such purposes.

Pont, near Roshon, Jan. 4.

C. WRIGHT.

RELATIVE PROPERTIES OF HOT AND COLD-BLAST IRON.

TO THE EDITOR OF THE MINING JOURNAL.

SIR,—Your last sheet of the year 1842, Mr. Editor, winds up with a full phial from Dr. Snop, but he appears to have but a very small phial, his drugs being only of Low Moor, Bierley, and Elsecar cold, and Milton hot-blast iron, and these are to correct all the ironmasters making iron from hot-blast, who are told that they are totally incapable of taking care of themselves, unless they follow his prescriptions. These same recipes of this self-named civil engineer have been published and republished, like other quack medicines; it is true, that in this last advice, there is a little mixture of Nomerle and Level, &c., with many words not quite intelligible or very grammatical, with some thought—important self-conclusions, but they are to be well shaken before taken. The doctor always fights very shy at Mr. Fairbairn, although he occasionally, when it suits, puts him cautiously into print. In Mr. Fairbairn's reports upon iron, in Vol. 6, second series of the *Manchester Memoirs*, you will see

Milton, No. 2 iron, mean breaking weight 430 lbs.
Elsecar, No. 3 ditto, ditto 410
This latter quality is generally selected by engineers, &c.

Probably the doctor is one-eyed, and is, consequently, blind to the other side of the question than the one he chooses to advocate, for, if you refer to this same report, you will also find that the second strongest iron there noticed, is

2 Devon, No. 3, mean breaking weight 407
3 Oldbury, No. 3, ditto 400
4 Carron, No. 3, ditto 397
5 Boscawen, No. 3 ditto 397
6 Batterley 392

All these works making iron from hot-blast.

I have heard that he once had the management of the Milton Iron-Works, (and to my cost, I have now by me some of their cold-blast iron), but he so physically the parties that they were very soon obliged to take care of themselves; perhaps, as he has it not now in his power to do so, he is trying to knock them down, but the blows he gives, should not be in holes and corners, under his own direction, as he has vowed—for, at least, as regards the terrible blow and a half that felled the poor Milton, he might, at that moment, have been aroused to some extraordinary pitch of vehemence, while, upon again cooling, the twenty-one, no doubt, very good things were inflicted upon Elsecar. Is not this, Mr. Editor, coming it rather too strong upon Milton, but I say that these trials of Mr. Fairbairn and the civil engineer, are only trials of different metals, not trials to determine the respective qualities of hot and cold-blast iron; trials for this purpose must be proceeded upon quite a different manner—let metal or iron produced at those works where the hot-blast is made use of, be procured—those works will occasionally have to repair the apparatus for conducting the hot-blast, and, no doubt, during that interval, the furnace will be kept going by cold-blast; here is a fair opportunity for a collection of iron to be tested, for two or three days, as I have been informed, will settle down the furnace to the change, notwithstanding you are told by the very civil engineer that three months are not sufficient, and this point may be easily verified by questioning any good keeper, who has attended any furnace worked from hot-blast. It appears to me that those who have hitherto written against this new method of making iron, attempt at mystification, either from interest or malevolent motives—no uncommon act on the introduction of any new system (witness that of inoculation when first introduced, and, subsequently, on the vaccine system), and they send out papers to keep up deception. Trials, as now proposed, might arrive at some truth if carried on by disinterested or trustworthy parties, for that bar iron from hot-blast may be made of the best, nay superior, quality, is fully established by the experiments of Messrs. Hawthorn, well known engine makers at Newcastle, and by the letter of Mr. Horn, the equally well known superintendent of all the extensive works of the late Mr. Mackintosh in this country, carried on under the directions of those eminent engineers, Messrs. E. Leather and Son of this town, both of which have been just published in the *Bradford Observer* of the 21st December, as having been read at the recent meeting of the Polytechnic Society of the West Riding of Yorkshire. *Yus.*

RELATIVE PROPERTIES OF HOT AND COLD-BLAST IRON.

TO THE EDITOR OF THE MINING JOURNAL.

SIR,—I was much pleased with the letter of "An Original Subscriber" in your last Number, for certainly it was high time that Mr. Hartop should not be allowed to disguise his spite with impunity any longer, under the specious guise of anxiety for the public good. Supposing him ever so conscientiously to believe in the superiority of cold over hot-blast iron, he ought, as a man of the world, to have reflected well before making so direct and violent an attack in that particular quarter, and then reasons might have struck him why it would be better policy to abstain from the course he has taken. He might have recollected, that previously to 1829 he was the managing partner at the Milton Works, using cold-blast, and producing iron of as bad a quality as to be almost unsaleable. Again, that under circumstances which it is not my province to enter into, but which were notorious enough herewith, having been compelled to succumb from that establishment, persons acquainted with the facts would receive from him, with much suspicion, statements so derogatory of the Milton iron as those he has indulged in. Thirdly, he well knew that from 1829 to the present time, the Milton iron has been steadily and constantly rising in character, and it has long been used in this town, more extensively than any other Yorkshire made iron, and that, too, without submitting to prices below others. Fourthly, could he reasonably suppose that the manufacturers in and around Sheffield, having daily experience of the good quality of the iron, would allow their judgment to be influenced by one who, to their own knowledge, had produced iron so immeasurably inferior when the works were under his management. Lastly, that as it was impossible, for this reason, that he could reckon upon damaging the character of the Milton iron in and around Sheffield, where the bulk of the work is consumed, he would lay himself open to the charge of being influenced by malice, for the very uncertain chance of destroying a fraction of the trade in other localities, by deterring persons, having no pre-knowledge of the iron, from using it; but even, in this view of the matter, his course would be sure to be, and actually is, very remote, because there is a sufficient number of practical men in every locality to which the Milton iron is sent, to outweigh his assertions, and he has himself unmasked his real aim in his continual allusions to the Milton works, by the unmasked spirit in which they are made, and by balancing up his arguments with misrepresentation and mis-statement.

In the paper read at the meeting of the Geological Society at Wakefield (afterwards published in your Journal), he quotes an experiment of Mr. Fairbairn's (from the *Manchester Memoirs*), to show the superiority of Elsecar cold-blast over Milton hot-blast iron, in its power to resist impact, but any one turning to the *Manchester Memoirs*, will find that Mr. Fairbairn published three experiments (on the same page) upon these two irons, and that two of those are most decidedly in favour of Milton hot-blast iron. Was it honest to suppress these? In the same paper, he says, "that they knew but little of the iron trade, who do not know that castings made from hot-blast iron are not worth so much by five, per ton as those from cold-blast, even in the very simple article of railway chairs." Now, this is more than a trap; the fact which he refers to in this—about the time this statement was made, the Great North of England Railway Company contracted with a Scotch brewer, using hot-blast, for a large quantity of chairs, at 41. per ton; they would be made of No. 2 iron, and Mr. Hartop was offering Elsecar No. 2 at 41. 11s., to which add cost of

moulding, casting, &c., &c., in Yorkshire, 11. 15s.—making 61. 10s., leaving a difference between the contract quoted of 41., and the price at which Elsecar cold-blast castings could have been supplied, of only 21. 10s.; but all this is no proof that cold are better than hot-blast chairs—indeed, as far as it goes, quite the contrary; nor is it any evidence of depreciation, as far as profit to the iron maker is concerned, for Mr. Hartop has, as yet, omitted to show that less profit is derived from iron at 50s. per ton in Glasgow, than from 95s. per ton at Elsecar. Mr. Hartop rather prevaricates, and with a tolerable smack of self-importance, asks—

"Can you wonder at my having come to the conclusion of the total uselessness of such hot-blast iron (as the Milton) for machinery purposes? and do you think that any experiments made at the Milton Iron-Works, under any circumstances, will be likely to alter public opinion on the subject?" I think he may rest assured that it will require more cogent reasons than any he has assigned, and facts advanced upon much better authority than his own, to make the slightest alteration in public opinion. I see that Messrs. Graham and Co. have very properly noticed, as it deserves, his unjustifiable remark upon Mr. Horn's letter to them, and any further comment is unnecessary; it is, however, edifying, inasmuch as it gives us to understand what is "the least" a civil engineer "can do" for parties selling him a cheap article, and what, of course, Mr. Hartop feels himself entitled to expect for every bargain he sells; the authority, too, in this instance, may be taken as good, for Mr. Hartop calls himself a civil engineer. *Sheffield, Jan. 11.*

[We think it only fair to Mr. Hartop, in any future discussion, to state, that the parties should attach their names to their communications. We like not anonymous letters, although we may know the writers.]

SMOKE PREVENTION.

TO THE EDITOR OF THE MINING JOURNAL.

SIR,—Permit me shortly to observe on your editorial remarks in the last Journal, respecting my patent and what is called Kurtz's patent. You observe, that "it is only due to Mr. Joseph Williams to state, that we have this week visited Mr. Majesty's dock-yard at Woolwich, and, by personal inspection and inquiry, ascertained the merits of the (Qy? Kurtz) application of heated air to the boilers of the *Urgent*." In this passage I recognise the deception practised on you, as well as on Captain Emerson and the Admiralty, by Mr. Joseph Williams, who, under colour of carrying into execution the patent of Mr. Kurtz, has introduced a palpable infringement of mine. The question you have raised, when you say "Query Kurtz?" is the real question here at issue, and by this let it be judged, as I feel persuaded that neither the Admiralty nor yourself will, if the matter be rightly understood, sanction this manifest imposition on the public. With respect to the identity of Kurtz's patent and the plan adopted by Mr. J. Williams, I appeal to the highest authority, namely Mr. Kurtz himself, and let that gentleman be heard on the subject. I refer you, therefore, to the advertisement which I herewith send you for insertion in the same Journal in which I request this letter may appear.

You have further observed—"So minute are the different modes adopted, that it is hard to say who is the inventor and who the infringer." As this observation embraces the patent of Mr. Hall and the plan of Mr. Billingsley, I will here shortly submit a view of each; and trust you will see that the distinctions, instead of being minute, are as broadly defined as are those of the hot and cold-blast principle, or of the Argand and common lamp. Mr. Hall's patent of 1836 (that of 1838 has no reference to the subject) is for several modes of heating the air and applying it when so heated through an aperture over the furnace-door. My patent, on the contrary, is for introducing cold air in a divided form, thus aiding its mechanical mixture or diffusion with the gas in the furnace. The main feature and object of Mr. Hall's, as stated in his specification, is the heating the air before its admission; that of mine is the dividing it. Mr. Kurtz's patent is also, like Mr. Hall's, for heating the air, by means of hollow burners and side brick passages or by hollow bars, and then introducing it, either by large openings in the sides of the furnaces, or through the well-known double bridge, patented by Mr. Parkes, in 1820. Mr. Hall heats the air by means of casings round the funnel or boiler. In neither, however, is the principle on which I rely, and on which my patent is based, even hinted at, nor does it seem in the remotest degree to have entered into their contemplation—namely, the causing the air, on its entrance, to be split or divided into jets or films, for the sake of presenting a greater surface to the gas, and to facilitate their mixing and blending. This division of the air being thus the main feature and object of my patent, while that of Hall and Kurtz is the heating of the air, under the impression that such heating will assist the process of combustion, but to which, right or wrong, I have uniformly objected. I should have said that Mr. Kurtz relies also on a peculiar arrangement of the fire bars—see his specification in Newton's Journal of Feb., 1842.

Now for Mr. Joseph Williams's deception on the public, under colour of carrying out the patent of Mr. Kurtz, in which he appears to have a third share, as agent. With respect to the arrangement of the fire bars, he has wholly departed from this, on which the patentee relies, and so also as to the heating process, which he retains but nominally, as, without this, there would have been no ground whatever for calling it Kurtz's. Finding, however, the value of my mode of dividing the air, he has, at the suggestion of an ingenious mechanic, introduced into the double bridge an apparatus furnished with a valve, by which the air is effectually split, or divided, and thus he has produced the desired effect, on which my patent is founded. Now, Sir, I assert that the whole of this iron apparatus inserted in the bridge, by which the air, in its exit to the gases, is divided, and split into thin films or divisions (and which is the whole merit of the plan), does not form any part of Mr. Kurtz's patent. How, then, this plan, which so substantially departs from that of Mr. Kurtz's, and so palpably adopts the mode and principle of mine, can be palmed on the public as Kurtz's patent, remains to be solved. All I require is, that while Mr. Joseph Williams is ostensibly adopting Mr. Kurtz's patent in the Admiralty vessels, he shall be confined to it, and not be suffered to rub me of my fair claim to what alone gives efficiency to the plan adopted in the *Urgent*. The Admiralty have full permission to adopt my patent, as I have already communicated to their agent, and I merely ask that they do not employ others to carry into execution, and under false pretences, which I here charge on Mr. Joseph Williams—that which fairly belongs to me. My plan has already been successfully introduced into many steam-vessels in Liverpool, including the mail contract packets, and into the *Hindostan* and *Oriental*, the latter also carrying the mails.

With your permission I will reply to Mr. Billingsley in my next letter. *Liverpool, Jan. 11.*

C. W. WILLIAMS.

ON THE FORMATION OF MINERAL VEINS.

TO THE EDITOR OF THE MINING JOURNAL.

SIR,—Your correspondent, "Geologus," possesses such an extraordinary store of knowledge, that in writing he forgets that we of humbler abilities cannot keep pace with his ideas, and are often obliged to stop a little on the road to look out for specimens, and to try to find out whence they came. The marine sedimentary origin of coal from the decomposition of organic and inorganic substances, &c., is well understood, and explained in Mr. Lyell's *Geology*, but I should like to know the meaning of the following passages—viz.:—"The whole country (North America) has the appearance of having once formed one vast inland sea."—"It is one series of sedimentary deposit, strikingly characteristic of their origin, without any of those dislocations which give birth to shallow theories."—"Does 'Geologus' mean to say that there is no dislocation in the above extensive area? If so, he is wrong; because the coal-fields and primary districts of Virginia are full of dislocations. The coal beds rest on a gneiss rock, this rock is nearly vertical, and running north and south. This gneiss rock has disturbed the coal beds of Black Heath Mines, and made the seams to appear like steps and notches."—"Geologus" says again, that "the rocks in the western state, below the coal formation, have evidently been deposited in a deep primitive ocean."—"the great, although unacknowledged, truth, that the ocean waters are gradually disappearing from off the surface of the whole earth." We are well aware that a great portion of our lands have been formed in deep seas, but does "Geologus" mean to say, that the surface of the sea has sunk below those points, and not that the deposits have risen from the deep? If so, how is it that the same effects are not visible on all the coasts of the globe? because I should suppose that the surface of the ocean, although sinking, would not be governed by the law of hydraulics; for instance, if it should sink at Calcutta 100 feet, we should find the same difference of level at Cork and Milford Haven, but this is far from being the case.—"This disappearance of the ocean waters"—the elementary constituents entering into, and becoming consolidated bodies, is quite sufficient to account for the numerous catastrophes which have taken place." I should like to know what cata-

strophes the simple sinking of the ocean can explain? and the proofs that the diameter of the aqueous part of the globe has diminished?—"The self-evident change in the position of the earth's axis." Where is the evidence? because mere assertions will not do in this age of inquiry. "Geologus" must, in future, support his assertions by real facts, if his views are intended for the good of science, or *pro bono publico*. I hope he will furnish us with a demonstration of the variable nature of the position of the earth's axis in your next. *T. H.*

King's College, Jan. 5.

THEORY OF MINERAL VEINS.

TO THE EDITOR OF THE MINING JOURNAL.

SIR,—The remarks of "S. R. P." are, to say the least of them, very unreasonable, and betoken a mind but ill calculated to take a comprehensive view of Nature. Mr. Hopkins's theory is not in detail before the readers of the *Mining Journal*; a mere outline is given, and that outline is given in a dogmatic puffing style, and has been freely commented on by "Geologus" and others; he has been invited to explanation, which has been most ungraciously refused; it is, therefore, out of character for himself, or his friends, to expect to have the ideas and knowledge of his opponents to work upon. The path "S. R. P." has been pleased to pursue, may not be approved of by "S. R. P.," the arguments brought forward may, and probably are, not understood by him, for we have yet to learn how far his talent entitles him to become the catechist; but they are such as cannot be disproved. Facts are placed against theories, which, in their working, prove as injurious to the interests of science, as to individuals who may be induced to speculate upon them; and a contemptuous negation of those facts, or attempts to burke the question, by leading to points not immediately connected with the subject, is incompatible with the advancing spirit of the present age. It requires no great expansion of intellect, as Messrs. Deakin, Budge, and Co., can testify, to advance theories, and then to leave to abler heads than theirs to dispute or confirm these theories. "S. R. P." would have "Geologus," in conformity with modern opinions, begin at the end instead of the fountain head; he talks of *primary achistus*, will he elucidate the meaning of this much abused term. The subject matter before us, possesses interest and conflicting evidence enough to fill volumes, and yet your modest correspondent would compress it into a few lines. *Geologus.*

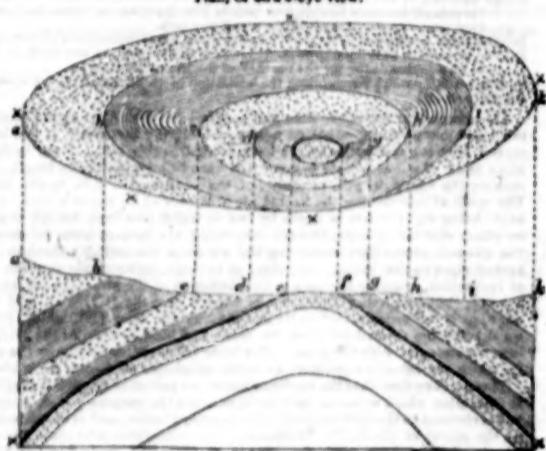
Jan. 5.

ON THE FORMATION OF MINERAL DEPOSITS.

TO THE EDITOR OF THE MINING JOURNAL.

SIR,—Coal districts, circumscribed by the underlying rocks showing at the surface, are usually denominated coal basins, and it has been remarked that, had the coal deposits not been disturbed by internal convulsions, the formation would, in every case, present itself in the basin shape; however this may be, certain it is, that, were one to throw a delf basin on a pavement, by which it would fly in pieces, the several fragments could not be tossed about in greater variety of ways than the coal formation is found to be by "faults," "dykes," and "dislocations." Sometimes it is found standing vertical, "edge coals"—in other places so perfectly horizontal, "flat," that it is difficult to drain it sufficiently for working; and, again, detached portions are met with where the trough, or basin shape, is perfect, and in some instances (although not so frequent) the "saddle shape" and "mantle shape." Under is an eye sketch (plan and section) of the latter formation in a colliery at which I am at present employed:—

Plan, or bird's-eye view.



Section.

These x x x x show the course the level takes in the coal. The letters, a, b, c, d, e, f, g, h, i, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z, point out the line of section, &c.; e f shows where the coal comes to the surface. In order to render reference from plan to section as clear as possible, the rocks are shaded alike on both. I would beg to notice the "clats," or "backs," met with in coal strata. These have no change of position, although a change occurs in the direction of the level, or bearing line. In the field represented by the above sketch they point north-east 30°, and are from one to four and five feet apart, and always parallel to each other. Sometimes a small step in the strata occurs at these "backs," which are then called "hitches," "reeds," or "cutters," cross these again at various angles, but are not so regular, nor do they divide the rock so perfectly as "backs." I have sometimes thought it might be of importance to learn whether "backs," or "clats," in all coal-fields had nearly the same polarity. *Jan. 2.*

A WORKMAN.

PRACTICAL MINING—THEORY REPUDIATED.

TO THE EDITOR OF THE MINING JOURNAL.

SIR,—Your Oxford correspondent, "J. S. D.," tells us no information is so truly valuable to the practical miner as that which enables him to pursue, with greater economy and profit, the practical workings of a mine. I admit it; but as one fact is worth ten surmises, I do beg leave to ask, if ever any geological schoolman has done that service to practical mining—if he has, let him name it, the where and when. Again, he says, the miner is well aware that no general rule can be applied, other than those with which they are well acquainted. Has the schoolman any rule by which he can assist the miner?—if he has, let him bring it forward. But I appeal to my mining brethren on the score of rule. Do you work without rule? have you no foresight before you, no guiding star to direct you? You might tell me, not a general rule; I admit it, but you know when you have drained the deep of your mine, you can work the whole to the rise of your drainage—yes, and work it by what rule you please—therefore, we have one rule, in the above sense of the word—that is, first to drain the deep of the mine, and then work it to the best advantage in our power. Now, has any schoolman ever, in any one instance, been of any service in draining a mine, or has he been of any service to the miner after he has drained his mine, by showing him the better way to work it. Again, he says, as the local phenomena of mines present features varying from each other, it is desirable that the same be placed on record, that the man of science may, upon practical information thus given, be enabled to draw up certain rules and observations for the guidance of miners in all parts of the world. What do you think of that, my brethren of the mattock and spade? You are to go first, you see, and grope your way, blindfolded as you are, and after you have made most egregious mistakes, and spent the money, you are to tell the schoolman how it was that you blundered on, and then they will tell you, and all the world beside (of course, as miners can learn nothing, not even by woful experience), how you are to avoid such mistakes in future—that will be poor satisfaction to you and me, when the money is all gone. Would it not be more rational and consistent for those schoolmen to lead us, in the first place, the way we ought to go, that the mistakes may be avoided altogether. He says, again, that myself, Mr. Budge, and Mr. Thompson, are not called upon to enlighten your readers on matters of which we appear to be profoundly ignorant. I assure you, my mining brethren, I never wrote with any view of enlightening you—it was to detestable humbug, and hold out in prominent hues, to your arrogance, presumption, and impidity; and, if I could, to expose the foolish credulity about how minerals were formed, and their out at all showing us how we are to work them. The world is made—that is wrong for us; what we want to learn is, the best way to extract the mineral pro-

duce of the world. He says, again, however deficient of local knowledge of mines and of science may be, they have still stores of information at their disposal. Why don't they come forward, and dispose of it to the best bidder? Likely it is money they want for it; if they really can be of any service to mining, it must certainly be worth the while of great mining proprietors to pay them well for their valuable information. But my opinion still is, that it will continue to be the practical miner that must unravel the secrets of Nature in the mineral kingdom. The letters of "A Workman," he says, are to the purpose: "A Workman," like the whole host of schoolmen, don't make his joints fit, neither will any of them come to the scratch in anything where geological and mining truths have, and can be, proved; they shuffle and quibble about what is out of their own power to prove, or even understand. There is one letter in the *Mining Journal*, by a person calling himself "A Tributer," who talks about trees full grown and fruit full grown upon them. Now, are we to conclude from him that the globe itself is increasing in size. How preposterous, how exceedingly foolish; he knows Mr. Dudge contemplated no such thing, but such stuff as that, is, as I said before, shuffling from the mark.

Bismarck, Jan. 2.

THOMAS DEAKIN.

MACHINERY FOR CRUSHING ORE.

TO THE EDITOR OF THE MINING JOURNAL.

SIR,—Having had the erection of much machinery for the crushing of different sorts of ore, I have often been surprised at observing that, notwithstanding the evident improvement in the newer modes, the old method is mostly adhered to. The rollers which appear to answer the purpose best, are those of not less than thirty inches diameter, while those most frequently used do not exceed eighteen. It is evident that the larger the diameter of the cylinder employed for crushing, the more acute is the angle between the circumferences, consequently, that a larger stone will be taken in and crushed without slipping. Besides this advantage there will be, with the large rollers, such a body of iron to wear out, say 15 cwt. on the two, before it will be required to change the shells; whereas, in the smaller shells, 6 cwt. could scarcely be worn out, before a change would be necessary. Taking these things into account, together with the shaky way in which small rollers are often fixed, and, generally, the necessity of an extra pair of fluted rollers on the top, to catch the stones at all, it seems to me that much trouble would be saved, by bringing the greater rollers into general use. The speed of the circumference of the large rollers answers best, at about twenty feet per minute, or in ratio of a water-wheel of twenty feet diameter, about three revolutions of the wheel to one of the roller.

A DRAKNER OF ORES.

St. Ives, Cornwall, Jan. 10.

AMERICAN STEAM EXCAVATOR—"YANKEE GEOLOGIST."

TO THE EDITOR OF THE MINING JOURNAL.

SIR,—I beg to hand you, for publication, the following brief description of this machinery, which I hope may prove interesting to your readers. This machinery consists of the application of steam power to the purposes of excavation and dredging, and, as the arrangement of parts is different for both of these objects, the best plan will be to describe—1st, the excavator for land purposes; 2d, the excavator for working under water, premising, however, that, in both arrangements, the principle of action is the same.

The land excavator consists of a strong horizontal framing of wood, furnished with two pairs of railway wheels, to enable the machine to progress on temporary rails laid down for the purpose, and is supported sideways by two large brackets, or arms, which project out from the frame, and are furnished with a large screw on each, to adjust to the inequalities of the ground. On one end of this frame is placed the boiler (an upright cylinder), and in front of it a small high-pressure engine. At the other end of the frame is placed a stout crane, similar to ordinary wood cranes, and on which the digging tool, or (as it is called) the scraper, is placed, with part of the gearing and tackle for working it. In the middle of the frame is placed the gearing for working the machine, and the main drum round which the hauling chain is wound. The rest of the tackle will be best described under the several movements of the machine, which are three—viz., 1st, the progressing motion; 2d, the digging motion; and, 3d, the turnabout motion.

The progressing motion is obtained by a spur-wheel, placed on the blinder wheel shaft, and working into a pinion, connected with the gearing used for turning the crane round, by which means the whole machine is moved backwards or forwards at pleasure.

The digging motion is a compound one, being so contrived that the scraper is driven into, and drawn forwards out of, the ground at the same time, which operation is thus described:—In front of the engine is the crank shaft (turned by the engine), on which is placed a pinion, working into a large spur-wheel placed on the main drum shaft, in front of the crank shaft. By these means the main drum is made to revolve and wind on its channelled periphery the hauling chain, which, passing up through the centre of the crane post, and over an *indented pulley* on its summit to another pulley at the job end, passes down under a pulley fixed to the scraper, and thence up to the job end, by which means the scraper is drawn forwards and upwards out of the ground. The scraper is formed of strong boiler plate iron, and consists of a bottom, two sides, and a loose end, and is furnished with four strong points, tipped with steel, to allow of emptying it, and is attached to a long wooden beam, or arm, to each end of which a chain is attached, which, in passing along its length, goes once round a small drum, fixed on a shaft, having bearings on the diagonal arms of the job. Bevel gear on this shaft connect it with similar gear on the *indented pulley* shaft, mentioned before, which, being made to revolve by the hauling chain, in passing over it, gives motion to the small drum, and, by the chain, drives the scraper into the ground.

The turnabout motion is performed by means of a large horse-shoe pulley, fixed to the crane post, having a chain passing round its edge, and thence over two guide pulleys, down to an *indented pulley*, beside the boiler, on the frame; bevel gear, connected with the crank shaft, gives motion to the shaft on which this pulley is placed, and which allows of a motion either way. In using the machine, the scraper is brought into a vertical position, and, by releasing the catches in a ratchet on the main drum shaft, the scraper falling is forced, by its own weight, into the ground; motion being then given to the main drum, the compound motion described before follows, and the scraper is filled and elevated to the proper height to be turned round and emptied into the waggon provided.

In the dredging arrangement, the same parts are arranged in a different manner in a strong barge, propelled by a screw turned by the engine; the crane is placed at one end of the boat, and the boiler, cylinders, and drums, in the centre. The scraper is furnished with a longer arm than that used in the land machine, but the principle of action is precisely similar. Instead of chains, toothed gears and racks are sometimes used to drive the scraper, as also a large bevel wheel to turn the crane round.

Hungerford street, Strand, Jan. 12.

GEORGE SPENCER.

NEWPORT AND NANTYGLLO RAILWAY.

TO THE EDITOR OF THE MINING JOURNAL.

SIR,—That indefatigable advocate of measures having for their object the improvement of the district in which he is so worthy a resident—Mr. R. J. Blewitt—has recently published a letter on the subject of the projected railway from Newport to Nantyglo—a line of vast importance to a large district of iron works and coal mines, and to a dense population in the immediate neighbourhood, and I am induced to call your attention to some important facts contained in the document alluded to, for which you will perhaps find room in your next *Journal*. The proprietors of the Monmouthshire Canal have now taken the alarm, and to endeavour to secure the favour of the public are now offering to reduce their charges on the tonnage of goods, and make other improvements (hitherto unexplained) which shall render their canal, with the existing tram-roads, quite sufficient for the public wants. The idea is a complete fallacy; few will trust their lives on the tram-road, which is so steep that a train let loose will run down of itself for miles, crushing and overturning everything in its course; and persons willing to go from Nantyglo to Newport, go a long way round, and at very great expense, to avoid the dangers of the tramroad; the promised reduction of one halfpenny per ton on iron and a farthing on coal can never be admitted as a substitute for railways, the maximum charge on which, for hedges, trams, and railway dues, will be only three halfpence for iron and five farthings for coal per ton per mile; while the reduced tonnage of the canal company will be two pence per ton and one penny coal, which, with the expenses of boats and haulage, will make loss at least three pence and coal two pence per ton per mile; but this preliminary saving is small when compared with the advantage gained in point of time—while a boat can only make five journeys in a fortnight between Newport and Pontypool, much heavier loads will be taken by the railway

in less than two hours. Since the iron masters of Merthyr have had the advantage of the Taff Vale Railway they can deliver and ship their iron fresh in its bloom as it leaves the rolling-mills; a new taste has sprung up among the iron merchants, who, if they now receive iron in the rusty state, which lying about on the wharf and the time employed in its transit by canal unavoidably bring it to, they actually refuse to pay for it. The canal company, by their enormous charges, drove the Nantyglo Iron Company (21 miles distant from Newport) to go a circuitous route of 33 miles, and yet, strange to say, they save nearly 50 per cent. in carriage. On the subject of coal further advantages may be anticipated; the railway being fenced in as private property and carefully guarded, not a pound of coal can be stolen, and the facilities and temptations for pilfering being removed a great saving to the county will accrue in the cost of prosecutions for coal stealing alone, and society benefited by the decrease of crime. The shipment of coal is another important consideration; the present cost (by hand and shovel) is at least four-pence per ton, and by which the large coal is nearly all broken, while by the same apparatus as is used in the north a loaded tram is suspended in the hold, and the bottom being removed, the coals slide gently to their place; the first cost of this machine is about 400l., it can ship many hundred tons in a day, and the cost will not exceed one farthing per ton. In conclusion, I would remark, that the advantages of a railway are so evident that it can be only from parties interested in some local undertakings that opposition will ever be offered. Extensive and almost universal railway communication is what is required, particularly in the manufacturing, coal, and iron districts; and nothing less will satisfy the growing requirements of the age. OBSERVER.

Nantyglo, Monmouthshire, Jan. 10.

LIGHTNING CONDUCTORS.

TO THE EDITOR OF THE MINING JOURNAL.

SIR,—My lightning conductor (of which more than fifty have been erected in Great Britain, and successfully weathered the storms of upwards of fifteen years) consists simply of copper gas piping, screwed into sockets at definite lengths, thus forming a continuous and uninterrupted conducting channel, and one composed of the best conducting material, next to silver. Provision is made for expansion and contraction, in reference to temperature. The summit is composed of a lengthened pyramid of solid copper, the sharp point and angles of which form a prompt and efficient means of receipt for the meteor. Immediately beneath the pyramidal terminus, the stem is perforated, so that a double conducting surface is provided for the escape of the lightning to the earth, as I am not sure that electricity penetrates a good conductor to a greater depth than one-twelfth of an inch, and this inference synchronises with the deductions of M. Biot. The lower terminus of the lightning-rod, glancing off at an angle enters the humid subsoil some feet below the surface. The lightning-rod is attached, at intervals, to the wall by fastenings of iron, interspersed slips of leather between the copper pipe and the iron holdfast. I also defend the material of the conductor from oxidation on galvanic principles, by ribbons of zinc at specific distances, with an intermediate membrane of caoutchouc; a wire of copper connecting the shaft of the conductor with the cylinder of zinc. For the safe transmission of a powerful current of electricity, I contend for a smooth, continuous, and rounded surface of the best conducting material. Is this guaranteed in the attachment of "strips of brass" to masts of ships at sea? I think not; and yet I consider this stipulation an axiom in electricity. It is easy to see the applicability of this conductor to the masts of ships—piping, sliding into each other, like the tubes of a telescope, would meet the contingency of striking the topmast and topgallant mast in a storm. Inland in the deck of the ship, the conductor, reposing in a groove, might pass over the side of the ship into the sea.

Lichfield, Jan. 3.

CARN BREA MINE—MANAGEMENT.

TO THE EDITOR OF THE MINING JOURNAL.

SIR,—You have, for some time past, allowed the columns of your *Journal* to be the vehicle of some very unfounded and malicious insinuations against the chief manager and officers of this mine. The writers of the letters to which I allude, appear to have altogether lost sight of the fact that Carn Brea is a mere private speculation, with which the public can have nothing to do, either with its management or mismanagement. Every shareholder can easily obtain any information he may require, and it is, therefore, quite clear, that the writer of the letter in your last paper, signed "A Shareholder," can have no interest in the mine, but must be actuated by some unworthy motives, in thus attempting to stab his neighbours in the back. The author of the letter signed "An Inquirer," seems to be a chip of the same block, but he is not satisfied with libelling the Carn Brea adventurers only, but has extended his vituperations to others, with just as much truth and reason. I would caution you and your correspondents against interfering again with the affairs of others.

Jan. 10.

A REAL SHAREHOLDER.

"A Real Shareholder" should have given his real name, for we have no evidence that the letter does not emanate from the delinquent. We have already adopted the opinions heretofore expressed by our correspondents on this subject, which "A Real Shareholder" would condemn, and who further cautions us kindly from "interfering again with the affairs of others," forgetting, on his part, where the line is to be drawn. Every mine which brings its shares into the public market is no longer "a mere private speculation," as regards the management or mismanagement of mines, it is our duty and, to expose abuses where they are found to exist. Captain Joseph Lyle will, doubtless, say, after reading the letter of our correspondent, "save me from my friends."

KELLEWERRIS MINING COMPANY.

TO THE EDITOR OF THE MINING JOURNAL.

SIR,—Can any of your correspondents inform me, through your valuable paper, if any dividend was made by the Kellewerris Company, which, I suppose, has been wound up some time since? Not having any means of ascertaining the required information, I shall be obliged by your assistance. Kester, Jan. 7.

A SHAREHOLDER.

[We advise "A Shareholder" to keep up his inquiries, and ask no questions.]

HYDRAULIC PROPULSION ON RAILWAYS.

TO THE EDITOR OF THE MINING JOURNAL.

SIR,—The Editor of the *Civil Engineer's Journal* gave, in his Number for December, a review of a pamphlet I have published, entitled *The Hydraulic Railway*. That review was replete with statements of so extraordinary a character, that I hastened to reply to it, and furnished the Editor with a letter in answer, in good time for his Number for the present month. It was most material that such an article should be met with an early answer; in the *Civil Engineer's* this month, the only notice that is taken of my letter is comprised in a brief statement that it is "far too long to be inserted," though not near so long, as respects the space it would occupy, as two articles in the present Number; and that the Editor will "endeavour to give an outline of my objection" to the allegations in his review, next month. Independently of the unjustifiable delay and serious loss of time, it is absurd to suppose the "outline" would be more correct, as respects the statements in my letter than the review was, regarding those in the pamphlet; and I have, therefore, recalled the letter in question, I now lay it before you, requesting you, as a respectable member of the impartial portion of the periodical press, to set me right with the scientific and railway world, by giving this paper publicity through the medium of your able columns. I claimed the insertion of this letter from the Editor of the *Civil Engineer's* in his perfunctory, as an act of common justice and literary fairness, both to his readers and to myself. I solicit it from you as from a gentleman who, I feel assured, is always as willing as he is able, to afford his assistance to the advancement of science in general; and with this view to lay my statement before the public where necessary, in order to enable them to decide with impartiality on any question then at issue.

Bath, Jan. 5.

J. G. SHUTTEWORTH.

TO THE EDITOR OF THE CIVIL ENGINEER AND ARCHITECT'S JOURNAL.

SIR,—Immediately on the appearance of your *Hydraulic Railway* number, I applied for a private note, as well as made it known publicly, by an advertisement in the *Railway Times*, that I would forward you an answer to the article in that number under the same title as that of the head of this paper, in good time for your next publication, appearing on the first of January. With that answer I now furnish you; and I rely on your sense of impartiality and fair dealing, and the character you would attach to the public for these questions, for its due insertion. The letter will be a long one; but, remembering your species of point at Mr. C. W. Will. I am adopting a proper course in giving you my answer in a separate article. In the course of this paper I shall have to make frequent reference to the pamphlet I have published, in order to make known my system of hydraulic propulsion—other than this letter would assume in bulk the character of another pamphlet—do you have so successfully ranged over the whole of that which I have promised, to give, in the shape of a few disjointed sentences, whatever might come, when I was torn from the body of the work, capable of little or no construction, that I was to furnish you a full answer, I should have felt more to do than in each case to transcribe the preceding and subsequent passages, and, as an arrangement, to transcribe each more than once, and, as an arrangement, to

would be no small labour. I shall, therefore, in some instances, content myself with referring to the page in the pamphlet where the refutation of the error or misstatement may be found. The first paragraph in the review is merely introductory, and is distinguished only for affording a glimpse of the confusion in which the article was to be written. It is careful to state that the invention claims the writer's credit for its ingenuity alone—in which case one would suppose all his own arguments would have been saved him. The second paragraph is an acknowledgment of one of three of the ideas put forth, inventions or claims made back on the subject of this invention, by a small weekly journal, named the *Hydraulic Advocate*, which had, last year, a moderate circulation. (See *Hydraulic Advocate*, No. 104, July 4, 1841; Article, "Atmospheric and Hydraulic Railways.") But the whole tenor of that article will satisfy every reasonable man who looks at it that I can no more be held responsible for the ideas of the writer on my invention, than the inventors of the atmospheric railway can for those expressed on theirs. A contrary supposition is absolutely absurd; and a reference to my specification would have immediately set this matter right. The paper in the *Hydraulic Advocate* for which I may, perhaps, be considered responsible is an abridgement of a private letter, which I addressed to the Editor, August 19, 1841, and which appeared in that journal the following month, namely Sept. 11. That paper, however, it may be otherwise defective, will, upon a fair perusal, be found to adhere to fundamental principles as those upon which I base my invention, of a character diametrically opposite to the strange notions which are brought forward in your second paragraph. And I may here properly add, the paper alluded to was once after rendered much more perfect, when printed off as a circular, with an addendum attached, and of which, I believe, a copy was forwarded to you.

The idea in your second paragraph, of "an exhausting pump" to empty "the pipes filled with water" before, instead of behind, the travelling pistons, is exactly self-contradictory. To tell on that stationary engines would be required to drag this water "along with great velocity," is certainly one way of getting my invention again out of a preposterous dilemma, in which you (not I) have placed it; and to intimate that the direct pressure of the propulsive column of water, following the piston, and driving it before it, was "contemplated merely as an occasional application, and additional means," is, in my only term, a monstrous imagination, utterly unauthorized by anything belonging to my invention, and above a writer who may possibly possess clear ideas on some other system, but who, I should suppose, still never be able distinctly to estimate the position and character of the hydraulic. When any peculiar arrangement of ideas is set up as a standard, and allowed to pre-occupy the mind, it will serve for nothing but to warp the understanding, when required to exercise itself on principles dissimilar in proportion and arrangement; and could never become a criterion with sensible men, for deciding on the merits of other inventions. Also, the statement that the atmospheric and hydraulic railways are similar in design, is a small portion of a fact, certainly, but nothing more. We both employ tubes and pistons, but these things have been so long open to the public, that they can belong to neither system. We both likewise make a longitudinal cleat, or slit, in the tube (which is also open to the public), but, in the atmospheric, the apparatus for this cleat acts externally, and in mine internally, and the formation of the cleat is equally affected. By the way, my cleat, acting internally, renders it impossible I should ever propose to apply exhaustion before the piston. The apparatus for the cleat, just alluded to, is in the continuous valve, which, in the atmospheric, is a long band of leather, of the same length as the railway itself, for which it may be destroyed, and coated on both sides (if I mistake not) with narrow iron plates. There are several adjuncts to it, as will be well known to every one acquainted with that system. In the hydraulic, the continuous valve is a stout flexible molecular cord, of nearly triangular formation (or rather being, in such instance—that is, for each length of propulsion piping—about seventy yards in length.

"So far the two plans agree," to borrow your own words, though I cannot add with you "exactly." If you had desired to acquaint your readers "exactly" with the relative features of the two systems, it might have been a reasonable thing to explain the "claims" of both specifications, and which I can now feel no objection to undertake for you, in order to render your review so far more accurate and distinct. The claim of the inventor of the atmospheric is, that the motive power is derived from the pressure of the atmosphere upon a moving piston as a driver, &c., and also for the guidance of that piston. Your third paragraph commences by informing your readers that I have "effected a complete change in the mode first intended, and now rely entirely for propulsive power on the pressure of a column of water, without any exhaustion." I have only to ask—When I did not! But it is useless losing my time on this matter, I have already replied to it. One small addition, however, to the preceding statement, I must make. You intimate that the column of water will have to act "against the pressure of the atmosphere." I grant you this, most willingly; and at the same time I invite you to consider the pressure on the other end of the column, whether it terminates in a reservoir, under the ram, or plunger, of a force-pump, or in any other manner, within range of the conditions under which I propose to place it. This will exactly balance, and, of course, contravene, the effect of your "pressure against the atmosphere," which, by the way, you do not seem to insist on with any great emphasis. Had you done so, you must have gone, seriously and accurately, into the question of my power; and that must have led to the admission, that our unbalanced opening atmosphere (had it existed) would have constituted an element, not of very great or important character for a system, I might almost say, over-brought with propulsive force.

You afterwards observe, I am to have, according to your statement, "reservoirs of water, of sufficient height to produce six atmospheres, placed at short distances along the line of railway." I propose nothing of the sort; there is not a word in the pamphlet to authorize the assertion. Instead of such heights of a blasted imagination, as these "immense towers, 200 feet high, every 200 yards," as, towards the close of this very old review, you explain yourself to mean in this quotation, I shall employ convenient and useful vessels, which I term "propulsion receivers." That these will present a simple and effective arrangement for the storing up and transmission of hydraulic power, has not been doubted by any of the scientific writers who have reviewed this system; and it would, I believe, have been extraordinary if this had been doubted; for the principle on which these receivers are to act is that embraced in one of the most commonly known hydro-mechanical laws. We use it in operation, on a small scale, and at a low pressure, in the common pump, where one free atmosphere only (the counterbalancing atmosphere being removed) throws up the column of water which is discharged at the foot of the pump; the main difference between the effect obtained at the pump and that to be produced at the propulsion receiver is, that, in the first instance, a column of water has to be thrown up vertically by air pressure, which requires a somewhat greater effect, while, in the latter, it has to be driven only horizontally.

It is to prevent, if possible, another series of strange misapprehensions, as regards the propulsion receivers, the effect to be obtained from them, and the mode of converting that effect into a great propulsive agent, I will now give two or three references to parts of the pamphlet, where either the whole explanation of these several matters will be found, or at least a material portion of it. It is sometimes difficult, if not impossible, to explain in one passage the whole matter, and, with the construction and arrangement of any given apparatus, linked, as it must be, in any extensive undertaking, with other apparatus, and the objects to be attained, the explanation of the object and nature of the propulsion receivers, with a sketch of their mode of operation, are described in the pamphlet, at page 16 and the following; their capacity, materials of which they are to be constructed, and strength, at the bottom of page 17; and their mode of being "charged," under pressure, with an intimation that a number of them will be worked by one steam or other engine—that is, in all positions where natural falls of water, or requisite elevations from contiguous high grounds, should not be found to be available; and an allusion to the laws in hydrostatics, under which this is an effect, will be found at the bottom of page 18. The precise number of receivers which each short column, or given length of pipe, will be, is carefully estimated, with the length of railway over which they will extend, in the first part of chapter 4, pages 24 to 27. In that space are calculations for the amount of engine power which will be requisite, and your scientific and engineering readers will be the best judges whether it is "great," as you term it, or decidedly "small," as I shall, in the meantime, affirm it to be, particularly when the work it has to accomplish, and the extent of railway, for which it has to drive over both lines of rails, is borne in mind. Here, to prevent misapprehension, let me correct an error not alluded to in the article. At page 24, the friction of a low-pressure steam engine is mentioned as being 7 lbs. per square foot; it is not so, as I have said, it is 7 lbs. per square inch of area of piston, and this, I believe, will be found to be little enough.

[This communication will be concluded in our next.]

SOUTHAMPTON DOCK COMPANY.

TO THE EDITOR OF THE MINING JOURNAL.

SIR,—As I promised in mine of last week, I now trouble you with a few lines on the subject of an "explanation" about the alleged receipt and acceptance by the company of "tenders for loans," which Mr. Stansbury, the secretary to the company, has favoured me with, that gentleman having offered to prove to me, that the directors' report of 31st of August last was "strictly correct." His "explanation," however, has only proved to me the force of the maxim—"Quod voluit, non potuit." (See, however, Mr. Stansbury may be satisfied with his "explanation." I must be allowed to say, that it has afforded me another instance of how completely puzzled the directors are to find even the shadow of an excuse for the assertion they have allowed to be published in their half yearly "report" of 31st August last, and which I will now more fully quote—"The directors have the gratification to report that they have received and accepted tenders for advances of money on the company's debenture bonds, under their Act of Parliament, and they anticipate now that the dock is getting into actual work." &c., &c. Now, I having stated that the company, at the time, had only received and accepted one tender, although they (not without an object) asserted that they had received and accepted "tenders," and Mr. Stansbury, by a letter which appeared in your *Journal*, having contradicted my assertion, I called at the company's office, and received the following "explanation" from Mr. Stansbury himself, of which the company may have the full benefit—viz., "besides the one tender for 700l., no other tender was, as the only one which had brought forth any money at the time the 'report' was published. Mr. Stansbury showed me that the company had received and accepted one tender for 700l., but that the reason the company did not obtain the money was this—The gentleman who had so tendered, and had his tender accepted, wrote to the secretary on the 10th July (just forty days prior to the publication of the directors' 'report' of 31st August), stating that, finding there were conditions attached to the loan, which he could not comply with, he had ordered his agent to replace his money in the hands of Messrs. Cuthbert and Co., his bankers; I—i.e., very good reason, why the money was not received, you will say. I leave this 'explanation' to prove how 'strictly correct' the directors' reports are."

Chips, Jan. 13.

P.S.—With respect to the advance of the empty timber ship, the *Boisier*, at the dock basin, on the 23d November last, to say up, in order that a presentment might be afforded for getting rid of the further payment of interest from that time, I have only to say, that the same being evidently not a loan, but "opening of the docks for business," I have brought an action against the company for interest in the time I occupied it really due.

